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Original Articles.

THE MEDICAL SERVICES IN THE
MUTINY

*Was it storm? Our fathers faced it and a wilder never
blew,*

*Earth that waited for the welage watched the galley
struggle through*

Kipling

By D G CRAWFORD, M B,

LIEUT COLONEL, I M S,

Civil Surgeon, Hughli

FIFTY years have come and gone since the Sepoy Mutiny in 1857 shook the British power in India to its foundations. To most of us, especially to the elders, the Mutiny has always been a subject of much interest. It has certainly been so to me. Several of my relations served in it, one being killed in action; and I was born in Bengal a few weeks after the first outbreak. Twenty-five years later, in 1882, soon after my return to India, I was posted to Delhi, and spent the greater part of my military service in that pleasant but unhealthy station. Even in Delhi, in 1882, the Mutiny seemed but a dim and distant memory. It does not appear to me now long to look back upon 1882. Yet the interval between the beginning of the Mutiny and my joining at Delhi was shorter than the period from that day to this. There were then serving in Delhi, a small station, at least four officers who had been through the Mutiny. Now there is no Mutiny veteran on the active list of a lower rank than Field-marshal. There was also then, living in Delhi, in Daryaganj, an old lady, who lived there when the Mutiny broke out, and who had formed one of the crowd of fugitives to the Flagstaff tower, on the 11th May 1857.

As is well known, the Mutiny was practically confined to the Bengal army, including the irregular corps in Rajputana and Central India. We would naturally expect, therefore, that the medical officers who lost their lives in the struggle belonged for the most part to the Bengal service. As a matter of fact, all the I. M. S. officers who were killed were Bengal men. They numbered twenty-eight, of whom no less than nine, one-third of the whole, perished at Cawnpore. It is not known with certainty how all of those nine died. For instance, acting Superintendent Surgeon Christopher Garbett is stated, in an obituary notice in the *Lancet* of 14th November 1859, to have died of wounds, in the list of casualties in the *East India Register* he is said to have died of fever in Wheeler's entrenchment, before the final surrender. Of the other 27, two were killed in action, Asst Surgeon T. H. Woodward before Delhi on 31st August 1857, and Asst-

Surgeon R. H. Baileum* in the advance on Lucknow on 26th September, one died of wounds, Asst-Surgeon E. Darby, in Lucknow Residency, on 27th October.

The twenty-eight medical officers killed were the following. The dates in brackets after their names are the dates of entering the service —

Superintending Surgeon James Graham (9th January 1820), killed by mutineers at Sialkot, 9th July.

Acting Superintending Surgeon Christopher Garbett (23rd May 1828), died in Wheeler's entrenchment, Cawnpore, June.

Surgeon Thomas Smith, Invalid establishment (22nd October 1831), killed by mutineers at Meerut, 10th May.

Surgeon Henry Hawkins Bowling (1st March 1838), killed by mutineers at Shahjahanpur, 31st May.

Surgeon Kinloch Winlaw Kirk (2nd October 1838), killed by mutineers at Gwalior, 13th June.

Surgeon Nathaniel Collyer (1st November 1838), killed at Cawnpore, 27th June.

Surgeon William Robert Boyes (1st August 1841), killed at Cawnpore, 27th June.

Surgeon Arthur Wellesley Robert Newenham (11th May 1842), killed at Cawnpore, 27th June.

Surgeon Thomas Godfrey Heathcote (12th August 1842), killed at Cawnpore, 15th July.

Surgeon Samuel Maltby (31st October 1843), killed at Cawnpore, 15th July.

Asst-Surgeon John Macdowall Hay (29th May 1843), killed by mutineers at Bareilly, 31st May.

Asst-Surgeon John Colin Graham (16th January 1844), killed by mutineers at Sialkot, 9th July.

Asst-Surgeon Hartwell Samuel Garner (11th February 1845), killed by mutineers at Sigauli, 23rd July.

Asst-Surgeon Robert Dallas Dove Allan (20th March 1845), killed at Cawnpore, 27th June.

Asst-Surgeon Thomas Moore (20th January 1847), killed by mutineers on road from Cuttack to Sambalpur, 17th November.

Asst-Surgeon William Baker MacEgan (9th March 1847), killed by mutineers at Jhansi, 7th June.

Asst-Surgeon Robert Lyell (25th September 1847), killed by mutineers at Patna, 3rd July.

Asst-Surgeon Horatio Philip Harris (7th April 1848), killed at Cawnpore, 12th June.

Asst-Surgeon George Hansbrow (4th February 1849), killed by mutineers at Bareilly, 31st May.

* Mrs Baileum was in the Lucknow Residency throughout the siege. Her husband, who was with the relieving force, was shot through the head on 26th September 1857, the day after the first of that force had entered the Residency. She subsequently published her experiences under the title "A Widow's Reminiscences of the Siege of Lucknow" 12mo Nisbet & Co, London, 1858.

Asst-Surgeon John Pierce Bowling (20th December 1851), killed at Cawnpore, 27th June

Asst-Surgeon Anthony Dopping (4th April 1854), killed by mutineers, Delhi, 11th May

Asst-Surgeon Robert Henry Baitum (11th January 1855), killed in action, in advance on Lucknow, 26th September

Asst-Surgeon Marcus George Hill (24th January 1855), killed by mutineers, Sitapur, 2nd June

Asst-Surgeon Daniel Macauley (4th August 1855), killed at Cawnpore, 15th July

Asst-Surgeon Edmund Darby (20th February 1856), died of wounds in Residency, Lucknow, 27th October

Asst-Surgeon William Henry James (20th February 1856), killed by mutineers, Agai, Central India, 4th July

Asst-Surgeon Thomas Hewlett Woodward (20th February 1856), killed in action, Delhi, 31st August

Asst-Surgeon Henry Thomas Cary (4th December 1856), killed by mutineers, Mehidpur, 8th November

In addition to those actually killed, many other officers succumbed to disease and to the hardships of the campaign. At least ten men of the Bengal service thus lost their lives.

Surgeon John Bannatyne Macdonald (27th February 1830), died of cholera in Lucknow Residency, 8th August 1857

Surgeon Thomas Christopher Hunter (24th July 1834), died at Cawnpore, 28th March 1858

Surgeon William Amys Rolfe (22nd December 1840), died in Calcutta, 4th August 1857

Surgeon James Anderson Nisbet (2nd April 1844), died at Multan, 9th March 1858

Asst-Surgeon Thomas Mawe (4th March 1844), died of fatigue and exposure at Manipul, Banda, after escape from the massacre at Jhansi, 28th June 1857

Asst-Surgeon William Sutherland Stiven (10th September 1846), died at Allahabad, 27th February 1858

Asst-Surgeon William Gardiner Morris (20th November 1848), died at Delhi, 13th January 1858

Asst-Surgeon John Kirk (4th August 1855), died at Attock, 21st July 1857

Asst-Surgeon William Boyle Chavasse (20th February 1856), died at Meerut, 2nd November 1857

Asst-Surgeon William Joseph Shaw (4th August 1856), died of phthisis at Dilkusha, Lucknow, 27th November 1857

Asst-Surgeon Frederick Christian Bushman (4th December 1856), died at Barkata, 20th January 1858

Others, who survived the actual campaigns, contracted disease which proved fatal before long. As one of such may be mentioned John James Halls (10th June 1854), Civil Surgeon of Shahabad, who was one of the defenders

of Arrah. He died on board the *Ceylon* on his way home on 6th November 1860.*

No officer of the Bombay service, as far as I can ascertain, lost his life in the Mutiny. Of the Madras service, though none were actually killed, four died during the Mutiny in the disturbed area.

Surgeon William Henry Scales (25th January 1841), died at Dinapur on 24th June 1858, of dysentery brought on by fatigue and exposure while serving in Sir E. Lugard's division.

Asst-Surgeon Ridley Porter (13th January 1853), died at Jabalpur, 17th September 1857

Asst-Surgeon George Dunman (24th February 1853), died at Camp Kuer, 14th June 1858

Asst-Surgeon John Stafford Bush (20th February 1856), died at Kampti, 15th August 1857

The first accounts of the outbreak of the Mutiny which reached England were partly fact and partly rumour. Many officers were reported as killed, who had in fact survived, and lived for long afterwards. In the *Lancet* of 26th September 1857 is a list of medical officers killed in the Mutiny, which includes the names of Assistant-Surgeon Joseph Fayrer (29th June 1850), who was fated to live for nearly half a century longer, and died so recently as 21st May 1907, and of Surgeon Richard Henry Oakley (8th January 1842), who lived till 11th December 1900.

Such mistakes, in the early reports received from India, were natural enough, and indeed inevitable. But in the *East India Register* for 1858, an official publication, issued several months after the event, the name of Assistant-Surgeon William Wotherspoon Ireland (4th August 1856), is shewn among the Bengal casualties, as "killed before Delhi, 26th July 1857." His injuries are thus described in the *Lancet* of 7th November 1857: "A ball had entered the eye, and passed below the brain, coming out near the ear. He had a second wound, though of a less serious character, a ball having entered the shoulder, which was found lodged in his back." (The action at Najafgarh, in which Dr Ireland was wounded, was fought on 25th August 1857, not July.) It is not to be wondered at that such wounds were supposed to be mortal. Dr Ireland, however, recovered more or less, but had to take sick leave in 1858, which was extended up to three years, at the end of which, being still unfit to rejoin duty, he resigned the service, from 1st August 1861. He is still alive, and well known as a specialist in mental diseases, and as the author of several books on his own subject, including "*The Blot on the Brain*," and "*Through the Ivory Gate*."

* Dr Halls wrote a short account of the Siege "Two Months in Arrah in 1857" 12mo London Longmans & Co., 1860

Many medical officers were wounded during the campaigns. I have been able to collect the following cases, from "war services" and other sources.

Surgeon William Abbot Green (B 6th June 1830), shot through the thigh at the disarming of the Sepoys at Dakka, 17th November 1857.

Surgeon William Brydon (B 9th July 1835), the sole survivor of the Kabul massacre in January 1842, shot through the loins while sitting at dinner in Gubbins' house in the Lucknow Residency, 21st July, 1857 (*Fayrer's Reminiscences*, page 179).

Assistant-Surgeon Nathaniel James Grant (B 18th December 1853), dangerously wounded in action with rebel cavalry at Rohm, June, 1857.

Assistant-Surgeon William Watson (B 1st August 1854), slightly wounded in head at Sasia Ghat, Agra, 5th July 1857.

Assistant-Surgeon William Henry Hayes (B 4th August 1855), wounded near Chaibasa, in a rising in the Kol country, 14th January 1858.

Assistant-Surgeon Archibald Hamilton Hilson (B 29th January, 1857), wounded severely in face by a musket ball.

Assistant-Surgeon James Lumsdaine (Bo 10th November 1852), wounded at battle of Kunch, Central India.

Assistant-Surgeon William Ashton Shepherd (Bo 9th December 1852), slightly wounded in action at Ambapani, while serving with the Satpura Field Force.

Assistant-Surgeon John Cruickshank (Bo 20th February 1856), severely wounded in the storm of Jhansi, where he accompanied the storming party.

Assistant-Surgeon Thomas Miller (Bo 19th November 1856), severely wounded in the storm of Jhansi.

The Army Medical Department lost many killed and wounded during the campaign. I regret that I am not able to give information about the A M D so fully as about the I M S, but among their casualties were the following —

Assistant-Surgeon S. Moore, First Dragoon Guards, killed at Delhi.

Surgeon Stack, 86th Foot, killed in the storm of Jhansi.

Surgeon J. H. Ker-Innes, 60th Rifles, wounded at Delhi.

Assistant-Surgeon S. A. Lithgow, 75th Foot, wounded at Delhi.

D. I. G. William Cruickshank, died at Simla, from the effects of service in the field, 5th November 1858.

Assistant-Surgeon Paterson Allen, F Troop, Horse Artillery, died at Jaitpuri, Bandalkand, of fever brought on by heat and exposure, 23rd December 1858.

Surgeon R. Dowse, 70th Foot, died of fever, on the march to Multan, 4th February 1859.

Among the officers mentioned in General Wilson's despatch, reporting the capture of Delhi, are the following medical officers —

Superintending Surgeon Edmund Tritton (Bengal, 4th December 1825).

Officiating Superintending Surgeon Campbell Mackinnon (Bengal, 30th March 1830).

Surgeon J. H. Ker-Innes, 60th Rifles, (A M D).

Surgeon Edward Hare, 2nd Fusiliers, (Bengal, 24th February 1839).

Surgeon James Peter Brougham, First Fusiliers (Bengal, 8th March 1840).

Surgeon David Scott, Medical Storekeeper, (Bengal, 20th December 1845).

Assistant-Surgeon J. J. Clifford, 9th Lancers, (A M D).

Assistant-Surgeon W. F. Macintyre, Commander-in-Chief's Staff (A M D).

The General Order issued by the Governor-General [Lord Canning] in Council, No 1383, dated Fort William, 5th November 1857, on the siege of Delhi, includes the following tribute to the medical officers — "The arrangements made by Superintending Surgeon E. Tritton, for the care and comfort of the numerous patients in hospital, have been most satisfactory, and the Governor-General in Council has pleasure in offering to that officer, as well as to the regimental and staff officers of the Medical Department by whom he was supported, this acknowledgment of their good service."

Brigadier Inglis mentions the names of the following medical officers in his despatch on the siege of Lucknow —

Surgeon William Brydon, 71st Native Infantry (Bengal 9th July 1835).

Surgeon John Campbell, 7th Light Cavalry (Bengal, 22nd December 1840).

Surgeon George Matheson Ogilvie, Sanitary Commissioner (Bombay, 9th March 1841).

Assistant-Surgeon Boyd, 32nd Foot (A M D).

Assistant-Surgeon Joseph Fayrer, Civil Surgeon (Bengal, 29th June, 1850).

Assistant Surgeon Samuel Bowen Pattidge, 2nd Oudh Irregular Cavalry (Bengal, 12th October 1852).

Assistant-Surgeon Henry Martineau Greenhow (Bengal, 20th January 1854).

Assistant-Surgeon Robert Bird, Artillery, (Bengal, 4th August 1855).

Assistant-Surgeon Edmund Darby (Bengal, 20th February 1856).

Sir Hugh Rose, in his despatch on the Central India Campaign, mentions the following medical officers, confirming a report of Superintending Surgeon Francis Shortt Arnott (Bombay, 19th February 1829).

Surgeon David Ritchie, Field Surgeon (Bombay, 11th August 1831).

Surgeon William Mackenzie, 3rd Hyderabad Cavalry (Madras, 14th January 1835).

Surgeon John Deas, 3rd Cavalry (Bombay, 20th March 1837).

Surgeon James Vaughan (Bombay, 2nd February 1842)

Surgeon Stack, 86th Foot, shot dead at storm of Jhansi, (A M D)

Surgeon Stuart, 14th Light Dragoons (A M D)

Assistant-Surgeon George Naylor (Bombay, 20th October 1852)

Lord Clyde (Sir Colin Campbell) in his despatch, dated 21st February 1859, announcing the final recapture of Lucknow, which brought the Mutiny to an end, as far as large operations were concerned, though much still remained to be done in the way of hunting down scattered parties and bringing into subjection rebellious tracts of country, acknowledges the services of the Medical Department as follows —

"To His Excellency the Right Honourable the Governor-General, Head Quarters Camp, Lucknow, February 21st, 1859

"My Lord—The military operations in the Presidency of Bengal, which ensued on the great Mutiny of 1857, having happily been now brought to a close, I have the greatest satisfaction in recommending warmly to your Excellency's protection two great departments of the military administration, to which the troops and the officers who have commanded them in their long campaigns are under real and great obligations. I allude to the medical and commissariat departments

"The former, being composed of officers belonging to the two services, has shone equally in the matters of general organisation and of regimental arrangements. The Director-General, Dr Forsyth, and the Inspector-General of Her Majesty's Forces, Dr Linton, C.B., in Calcutta, have worked successfully to meet the great requirements made on them, and the staff and regimental medical officers have well maintained the credit of their noble profession, and the reputation for self-sacrifice which belongs to the Surgeons of Her Majesty's Armies,—a reputation which is maintained in the field on all occasions, as well as in the most trying circumstances of the hospital"

"Clyde, General, Commander-in-Chief, East Indies"

A number of medical officers received the Companionship of the Bath, for their services in the Mutiny

19th January 1858 —Superintending Surgeon Edmund Tritton (Bengal, 4th December 1825), Delhi

24th March 1858 —Surgeon John Campbell Brown (Bengal, 5th July 1836), Delhi

16th November 1858 —Surgeon John Campbell (Bengal, 22nd December 1840), Lucknow

16th November 1858 —Surgeon William Brydon (Bengal, 9th July 1835), Lucknow

16th November 1858 —Surgeon John Henry Orr (Madras, 22, February 1837), Central India

16th November 1858 —Surgeon G M Ogilvie (Bombay, 9th March 1841), Lucknow

22nd March 1859 —Superintending Surgeon F S Ainott (Bombay, 19th February 1829), Central India

22nd March 1859 —Surgeon William Mackenzie (Madras, 14th January 1835), Central India

May 1859 —D I-G John Charles Graham Tice (A M D)

May 1859 —D I-G Francis William Innes (A M D)

May 1859 —D I-G John Fraser (A M D)

May 1859 —Surgeon Charles Alexander Gordon, 10th Foot, (A M D)

May 1859 —Surgeon James Gordon Inglis, 64th Foot (A M D)

May 1859 Surgeon Joseph Jee, 78th Foot (A M D)

The Army Medical Department, which had already won three Victoria Crosses in the Crimea,* gained three more in the Mutiny, as follows —

Surgeon (afterwards Surgeon-General and C B) Herbert Taylor Reade, 61st Foot, at storm of Delhi, 14th and 16th September 1857

Surgeon (afterwards Inspector-General and C B) Joseph Jee, 78th Foot, Ross-shire Buffs, at first relief of Lucknow, 25th September 1857

Surgeon (afterwards Surgeon-General and K C B) Anthony Dickson Home, at first relief of Lucknow, 26th September 1857

The older members of the service will remember Sir Anthony Home as P M O, H M's Forces in India, in the early eighties. He got his K C B as P M O in Ashanti

The Honours given in celebration of the King's birthday on 28th June 1907, include 37 C.B.'s given to Mutiny veterans, in celebration of the fiftieth anniversary of the campaign. Among them were Surgeon-General T Tarrant and Deputy Surgeon-Generals E M Sinclair and A Eteson, the two former of the A M D, the last of the Bengal Medical Service. All three, of course, have long since retired from the Army

Four Assistant-Surgeons of the Bengal Service received brevet promotion to Surgeon, viz, J Fayrer, H M Greenhow, and R Bird, all for the defence of Lucknow, and Joseph Walter Raleigh Amesbury (11th January 1851), all dated 14th August 1860. The mutiny services of the last-named include commanding a troop of the 3rd Oudh Irregular Cavalry, and raising a troop of volunteer cavalry which served under Generals Neill and Havelock. Assistant-Surgeon Henry Mills Cannon (Bengal, 1st June 1846) was also recommended for a brevet of Surgeon, but in the meantime got his step in the ordinary way, by seniority, from 16th September 1859

* Surgeon J Mount (afterwards Surgeon General and K O B), at Bahadur, 26th October 1854

Asst Surgeon (afterwards Surgeon Major) T E Hale, 8th September 1855

Asst Surgeon W H T Sylvester, 23rd Foot, 8th September 1855

Not long after the end of the Mutiny, three of the Asst-Surgeons who served in the Residency throughout the defence of Lucknow, were posted to important civil appointments in Calcutta, Fayrer to the Professorship of Surgery, and Partridge to that of Anatomy, in the Calcutta Medical College, and Bird to the Civil Surgeoncy of Howrah.

Now, when over half a century has passed since the beginning of the Mutiny, there are still living, on the retired list, nearly one hundred officers of the I M S, who entered the service over fifty years ago. The number of survivors speaks well for the physical strength and vitality of our predecessors. We give their names below. Those marked with an asterisk have the Mutiny to their credit among their war services. Dis. Hinton, Macrae, Elton, and Mactier, also served in the first Sikh War, the Sutlej campaign, Hinton, Maxwell, and Ray, in the second Sikh War, the Punjab campaign, G S Sutherland, Williamson, and Ross, in the Crimean War.

Pre-Mutiny Officers of the I M S still surviving

BENGAL

Hinton, H B	14 1 39	* Eteson, A	20 5 54
Macrae, A C	24 1 39	* Watson, W	1 8 54
* Elton, H	9 9 43	Bellaw, P F	6 9 54
* Mactier, W F	3 12 44	Macnamara, N C	4 11 54
* Maxwell, T	26 1 46	* Loch, J H	20 12 54
* Webb, O K	1-7 46	Amesbury, S C	14 1 55
* Brown, J B S	20 10 46	Mantell, A A	24 1 55
Small, D H	21 11 46	Poole, G K	14 3 55
Ray, G H	3 1 47	* Watson, G A	4 8 55
Payne, A J	20 12 48	Kendall, B	4 8 55
* Parker, R	1 1 49	* Fairweather, J	4 8 55
* Mackellar, E	9-6 51	* Planck, C	4 8 55
* De Renzy, A O O	29 7 51	* Carter, F	4 8 55
* Christison, A	20 10 51	* Hayes, W H	4 8 55
* Corbryn, J C	24-11 51	* Thornton, J H	9 1 56
Beatson, W B	30-6 52	* Powell, F	20 2 56
Silver, E D	20-7 52	Ince, J	20 2 56
* Pasko, C T	26 8 52	* Jones, J	20 2 56
* Tison, J E	17 6 53	Dallas, A M	20 2 56
Simpson, B	20 10 53	* Ireland, W W	4 8 56
* Grant, N J	18 12 53	* Bensley, C E W	4 8 56
Duka, T	4 1 54	* Caldwell, W S	29 1 57
Lwinence, J J T	20 1 54	* Sutherland, G S	4 8 57
* Greenhow, H M	20 1 54	* Bonavia, E	4 8 57
Farncombe, J B	20-2 54	* Dickson, L F	4 8 57
* Sutherland, P W	6 5 54		

MADRAS

* Macleod, A C	8 3 41	* Busteed, H E	4 8 55
Young, H	8 1 42	Williamson, *B	11 1 56
* Fitz Gerald, P G	20-3 46	* Bidie, G	20 2 56
Van Someren, W J	4-7 46	Hefferman, J J	20 2 56
Paul, J L	20 1 50	Henderson, J	20 2 56
* Colvin Smith, O	3 11 51	Garnack, A C	4 8 56
* Harris, W H	13 2 53	* Ross, J	29 1 57
* Rean, W H	14-5 53	Heard, S T	29 1 57
Cooper, C	20 11 53	Beaumont, T	29 1 57
Wyndowe, S J	24 3 54	* Kelly, W P	29 1 57
* Beamish, A H	10 6 54	* Smith Wynne, W A	29 1 57
Marr, G	24-1 55		

BOMBAY

Reynolds, J	3 7 45	Cook, H	24 1 55
Sylvester, C J	3 5 46	Diek, R	24 1 55
Mills, J	3-4 48	Seward, G E	4 8 55
Beatty, T B	20 5 51	Pinkerton, J	1 8 55
Thorold, H C	20 3 52	* Joynt, C	20 2 56
Stedman, F S	10 9 53	* Cates, W E.	20 2 56
Partridge, W P	3 7 54	Colston, C K	20 2 56
Butler, E R	4 10 54	Muller, T	19 11 56
Birdwood, G	20-10 54	Byramji, R	29 1 57
Niven, W	24 1 55		

A CRITICAL ANALYSIS OF THE ETIOLOGY AND SYMPTOMATOLOGY OF THE THREE-DAY FEVER OF CHITRAL, AND AN ANALOGY BETWEEN THIS CONDITION AND DENGUE FEVER

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In describing the three-day fever of Chitral,* I drew attention to the similarity of this condition to dengue, commenting on this fact as follows—"The similarity of this disease to dengue, as far as the single paroxysm is concerned, is sufficiently striking to cause some surprise at the absence of a rash and of terminal fever. I have already indicated how these are wanting, and without them it is impossible to consider the disease dengue."

The work of Ashburn and Craig,† on the etiology of dengue, has awakened a new interest in this affection, and has led me to reconsider the possibility of the acknowledged similarity of Chitral fever to dengue, being in reality an identity of the former to the latter affection. It has appeared also to me to be more necessary to endeavour to demonstrate the identity of Chitral fever with an affection of established place in the category of disease, than to add it as a separate entity to the already long list of disease to which man is heir. For this purpose, I shall endeavour to put my work on this affection to a critical survey, after a lapse of three to four years from it, using as the basis of this survey Ashburn and Craig's account of dengue fever.

1 THE INFLUENCE OF ATMOSPHERIC CONDITIONS

In discussing the influence of these conditions in dengue, one point on which writers unanimously agree is the importance of them. "Hot, sultry weather, with abundant rains is by all thought to favour the occurrence of epidemics. Nearly all agree in stating that the lowlands, seaports, the deltas of rivers and the neighbourhood of marshes, are favourable places for the occurrence of the disease, while it seldom prevails extensively inland, and almost never at high altitudes" (Ashburn and Craig). Similarly, Lichtenstein remarks of dengue "When it did extend to 4,000 feet the season was exceptionally hot. The disease has a marked preference for the hot season and almost always ends, as if suddenly cut off, on the recurrence of cold weather." It would appear, therefore, that while dengue prefers the hot, damp lowlands, it can and does occur among the hot, dry uplands, as in the case of the Syrian epidemic which occurred at a height of

* The Three-day Fever of Chitral. McCarrison. I.M.G., January 1906.

† The Etiology of Dengue. Ashburn and Craig. The Philippine Journal of Science, May 1907.

4,000—5,000 feet Manson is of opinion, that the hygienic condition of the atmosphere is without manifest influence, while both this author and Scheube are agreed that epidemics of dengue occur indifferently during the dry or rainy season

Turning now to Chitral fever, it is shown in my original account of this affection that, "The disease requires a high temperature for its development. It makes its appearance yearly when the mean external temperature rises above 75°F. It disappears with the arrival of the colder autumn and winter months." "Rainfall, unless it occurs in such quantities as to lower the atmospheric temperature markedly, and that for some time, is a factor of little or no importance."

With regard to the topography of the country, it may in this place be said that Chitral is situated at a height of 4,500 feet above sea-level. The valley is narrow, being not more than one mile broad at its widest part. It faces due north and south, is rocky, and the hills which confine it on either side are barren, bare and sun-dried.

The atmosphere is very dry. At Dosh and Chitral, where the troops are stationed, there is considerable cultivation, chiefly barley, wheat, rice and maize.

Speaking of the distribution of Chitral fever in this valley, I have said "it occurs as far north as Keshun (6,480 feet). It does not, so far as I have been able to discover, exist at higher altitudes." So far, then, dengue and Chitral fever may be thus contrasted. dengue is a disease which occurs by preference in the hot, damp lowlands; while Chitral fever is found in the hot, dry uplands. The former does exceptionally occur at altitudes which correspond to those at which Chitral fever is found, while a disease similar to the latter occurs in Mian Mi. In neither would the hygienic condition of the atmosphere appear to be of much importance, dengue is not influenced to any extent by rainfall, nor is the rainfall of Chitral a factor of much importance to Chitral fever. Both diseases require a high degree of atmospheric temperature to promote their spread, and both disappear on the onset of the cold weather.

For a consideration of the charts, bearing on the influence of atmospheric conditions in Chitral fever, I would refer the reader to my original account of the disease in the January 1906 number of this Journal.

2 THE DEVELOPMENT, COURSE AND TERMINATION OF AN EPIDEMIC

It will be interesting to contrast the Fort William M'Kinley epidemic of dengue, as described by Ashburn and Craig, with a similar epidemic of Chitral fever. In the former epi-

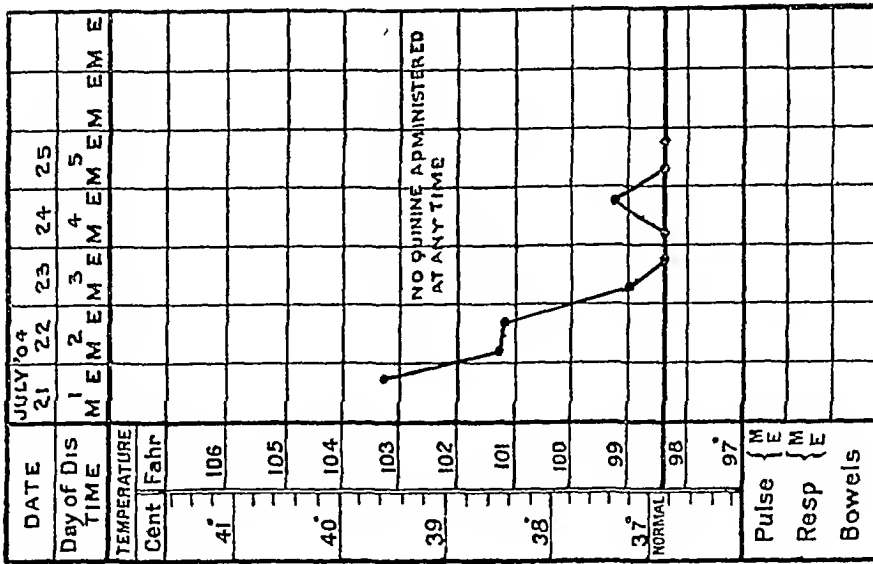
demic the barracks of those troops were first affected which were "situated nearer the stream than any of the other barracks of the post. The troops almost entirely escaped the infection whose barracks were situated at least two miles from the stream upon high, well-drained land." In the epidemic of 1904, in Dosh, it was observed that, "The disease was prevalent among the people of the country before it became epidemic among the garrison." Locally, Dosh is divided into two, Upper Dosh and Lower Dosh. Lower Dosh comprises the village with its cultivation, the civil dispensary, the transport and dooly-bearer lines, etc., while Upper Dosh consists of the fort only, where the garrison is quartered. Upper Dosh is on the side of the hill, some 300—400 feet higher than Lower Dosh, though not more than 300 yards distant from it. It was in Lower Dosh that the epidemic of 1904 first made its appearance. The first case of the disease occurred in the civil dispensary, which is largely attended by natives of the country, in a boy who had arrived from Kafiristan eleven days previously. This case occurred on the 5th of April. The disease made its appearance in the boy eighteen days after he had left his home in Kafiristan. He did not, therefore, bring it with him. The next case occurred in the transport lines, about 200 yards distant from the civil dispensary, thirteen days later. The third case, in the dooly-bearer lines, after a lapse of four more days. In Upper Dosh, the disease made its appearance during the last week of April. From the twenty-fourth of April to the fourteenth of May, eight single cases occurred at short intervals, and without any apparent connexion between them. After this date it spread with great rapidity. A point of great interest, in contrasting these two epidemics, is, that while Ashburn and Craig attribute the course of the epidemic of dengue to the action of mosquitoes as carriers of infection, Anopheles are in Chitral almost completely absent at the time (April) when the epidemic is commencing, while mosquitoes of the genus *Culex* are present though not in large numbers at the commencement of the epidemic. Sandflies, on the other hand, are at this time beginning to be abundant; both these insects and mosquitoes of the genus *Culex* abound during the course of the epidemic. A point on which all authors are apparently agreed with regard to dengue, is the peculiar suddenness of its rise and extension and the general prevalence of the disease in an affected community. I have recorded the fact that "Chitral fever does not set in abruptly, a series of single cases introduces the epidemic." I venture to think that the fact, that I had already had experience of one epidemic of Chitral fever, and that I was waiting for the appearance of the next, was responsible for the recognition of the cases I have quoted as having introduced the epidemic of 1904. Had I not had such experience, or had I confined my attention

ATYPICAL CHARTS OF THE THREE-DAY FEVER OF CHITRAL

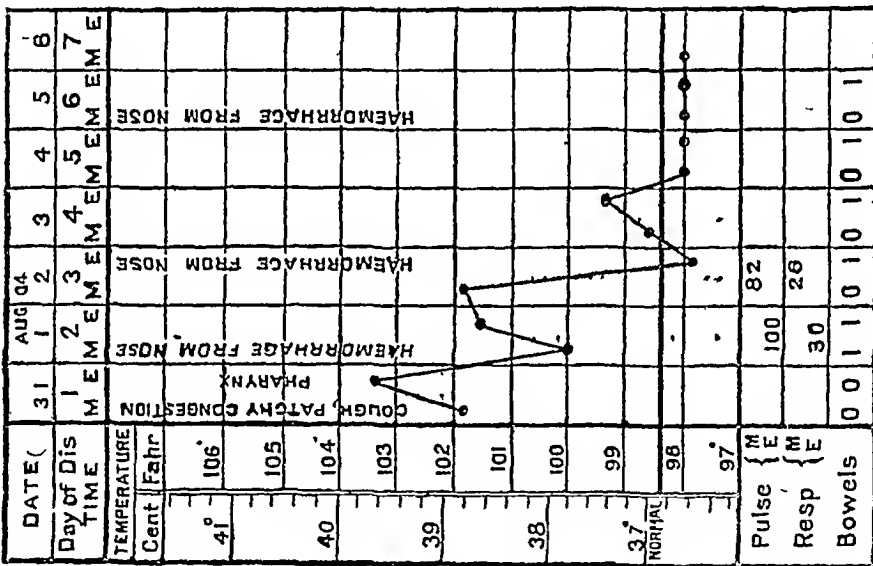
By CAPTAIN R. McCARRISON, M.B., B.CH., I.M.S.,

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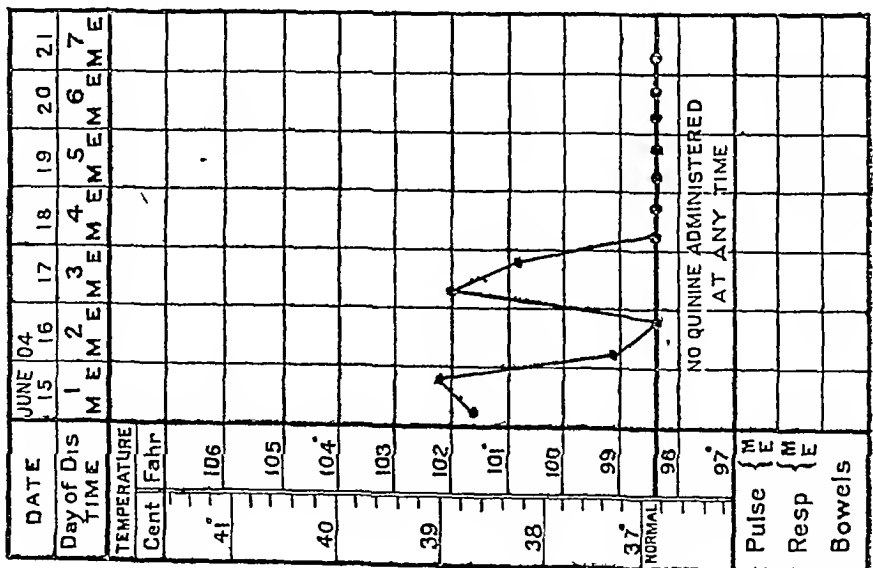
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II



I



to the troops in Upper Doshi alone, I must then have recorded the abrupt onset of the disease among them, I doubt whether the onset of dengue is, in the light of these remarks—and it does not appear to be in the case of the Fort William M'Kinley epidemic,—any more abrupt than that of Chitral fever. Chitral fever resembles dengue in the matter of its rapid extension and the general prevalence of the disease in an affected community. In dengue, the termination of the epidemic is said to be abrupt. In Chitral fever, the epidemic exhausts itself gradually, a rule to which that of 1903 is an exception*. It dies out when all those who were susceptible have suffered from it. In 1903, if my charts are consulted, it will be found that the termination of the epidemic was abrupt. Chitral fever also resembles dengue in this, that the removal of a susceptible body of men among whom the disease is prevailing, to an immune area, cuts short the epidemic among them. I am not convinced that, so far as the course of an epidemic is concerned, there is any essential difference between the two diseases.

It is known, that in certain countries dengue is endemic, as in parts of Egypt and Syria. Authors do not give any information as to the conditions which have determined this endemism. In the case of Chitral fever, however, which is obviously endemic, as well as epidemic, the conditions which have given rise to the endemism are, in large part, physical. Chitral is best described as a huge bowl compressed laterally. It is bounded on either side by hills through which there is no passage. The only door into the country from the south is the Lowari Pass (12,600 ft.), while the Shandawar Pass (12,000 ft.) closes it at its northern end. Chitral and Doshi are situated at the bottom of the bowl. If it is remembered that the incubation period of the disease is five to six days, never longer, that the conditions for its spread do not exist above a height of 7,000 feet; that during an attack of the disease the victim is so utterly prostrated that he can barely move, that Doshi is ten days journey, by the southern route, to the nearest area where the conditions for the spread of the disease might exist, while it is fifteen days journey from a similar area by the northern route, it will become apparent why the disease is confined to Chitral. How the Chitral fever virus rides over the six winter months from October to March is unknown. It is not unlikely that dengue, if introduced into a country such as Chitral is, would behave in a way identical with that of Chitral fever.

3 CONTAGION IN DENGUE AND CHITRAL FEVER

Ashburn and Craig have demonstrated that dengue fever is not contagious. Nor is Chitral

fever. In both diseases the removal of a body of men, among whom the disease is prevailing, from the infected locality, causes the almost instant disappearance of the disease. I have commented on this point in my account of Chitral fever as follows:—"It is the locality not the disease which infects. Chitral fever can only be acquired in an infected locality, and is incapable of development elsewhere, unless the conditions necessary for such development are present. The disease ceases abruptly after the lapse of five days (in rare cases six) in a body of susceptible individuals, removed to an immune area. Cases of the disease continue to occur among the men so removed for five days, but it does not spread to the old residents of this area, though they may be most susceptible to it." Ashburn and Craig, speaking of this fact with regard to dengue, remark, "removal from the focus of infection and from the disseminator of the infection, resulted in a complete disappearance of dengue." There is no better established fact than this with regard to Chitral fever. The continual movement of troops to and from Upper Doshi have afforded ample proof of it.

In the dengue epidemic under consideration, contiguous barracks were not affected in order a fact which is also true of Chitral fever and is an additional proof of the non-contagious nature of both diseases. But, with regard to the question of the contagious or non-contagious nature of dengue, the statements of authors are very much at variance. One is struck with the extraordinary diversity of opinion on a point the truth of which would appear to be so readily demonstrable. Scheube remarks "that dengue is contagious seems to be proved by the frequency with which doctors and nurses are attacked by it." Ashburn and Craig, on the other hand, find in the non-infection of attendants a proof of the lack of contagion. I find also in my notes of Chitral fever the following entry:—"Men admitted into hospital for other diseases did not, in 1904, contract the disease while there."* It is to be noted in this connexion that all the beds were provided with a superior type of sandfly-proof curtain, and that these were properly used. Ashburn and Craig consider that dengue fever is for the reasons above stated mosquito-borne. I am not prepared to go so far with regard to Chitral fever. It may be mosquito-borne, sandfly-borne, or due to place infection, the point will be dealt with later.

4 EXAMINATION OF THE BLOOD

It will be convenient to tabulate the results obtained by Ashburn and Craig in dengue, and

* A mosquito brigade was actively employed during this year.
R. McC.

* This note refers to the Goorkha Regimental Hospital only, where sandfly proof nets were used.—R. McC.

those obtained by myself in Chitral fever, as follows —

DENGUE

(1) There does not occur in the blood of dengue any visible organism, either bacterial or protozoal in nature, which can be considered as the cause of the disease. We have not observed any protozoon in the blood.

(2) Dengue is not accompanied by anemia, the red blood count being normal in uncomplicated cases. There are no characteristic morphological changes in red corpuscles, leucocytes, blood plates or blood plasma.

(3) Dengue is characterized by a leucopenia, and, in the vast majority of instances, by a decrease in the polymorphonuclear leucocytes and a marked increase in the small lymphocytes, the increase in the small leucocytes is constant throughout the disease.

(4) Blood cultures—negative

CHITRAL FEVER.

No organism of a bacterial nature is present in the blood stream. Nor has any organism of a protozoal nature ever been met with.

No observations were made with regard to the red blood count. No departure from normal was observed with regard to the form of the red blood corpuscles, leucocytes, or blood plates.

The total number of leucocytes diminishes during an attack of this disease. This diminution is not apparent till the temperature begins to drop. During the decline of the fever the number of leucocytes often falls to 4,000 per cmm or even lower. Of 33 cases where differential counts were made the polymorphonuclears were decreased in 17, while in the remaining cases they were within normal limits. There is in the majority of cases an increase in the mononuclear elements of the blood.

Blood cultures—negative

In Chitral fever, actively motile bodies, but not bacterial or protozoal in nature, were plentiful in fresh blood. These are probably motile fragments of disintegrated blood corpuscles. They are found in other diseases and are not peculiar to Chitral fever. Hunt has observed similar bodies in dengue.* These results are sufficiently alike to excite interest. I may here point out that my investigation of Chitral fever had for its primary object the differentiation of this disease from malaria, with which it had long been confounded.

5 INOCULATION EXPERIMENTS

Ashburn and Craig have succeeded in producing dengue fever by the intravenous and subcutaneous inoculation of blood, filtered and unfiltered, into susceptible individuals. They conclude from these experiments that the organism of the disease exists in the blood but is ultra-microscopic. In the case of their experiments with unfiltered blood, intravenous inoculations were made in eleven cases. Of these they are satisfied that seven developed the disease, while the three who did not, they consider to have been immune.

In my inoculation experiments in Chitral fever, subcutaneous injections were made in five cases, and intravenous injections in two. "No reaction occurred, except in one doubtful case when, on the fifth day after the operation, without symptoms being present, the temperature rose to 98° 8' F." My volunteers were, however, all Hindustanis or natives of the Punjab and I discovered later that the majority of these are immune to the disease. As an instance of this immunity I may mention the fact that, in 1904, among a body of 104 Punjabis only two cases of this disease occurred during the whole course of the epidemic. On the other hand, the Madras Sappers and Miners suffered rather more than this (7%) though to nothing like the same extent as Gorkhas or Europeans. *The results of my inoculation experiments I regarded as inconclusive.* It is necessary that they should be repeated in men of known susceptibility. I have always thought that the case in which a slight rise of temperature did occur may not be without some significance, only a repetition of the experiments can determine this.

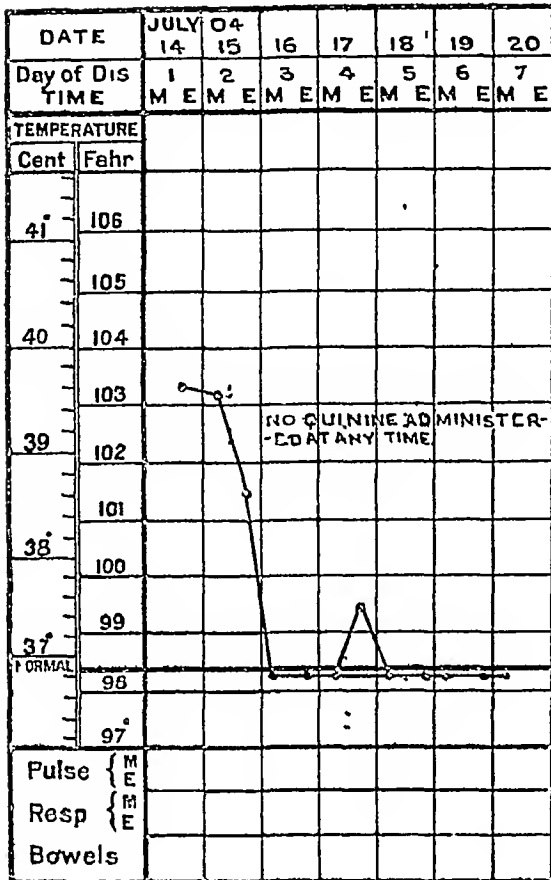
6 EXPERIMENTAL TRANSMISSION OF THE DISEASE BY SUCTORIAL INSECTS

Ashburn and Craig have demonstrated that dengue is disseminated by mosquitoes of the genus *Culex fatigans*, Wied. I have pointed out that at the time the epidemic of Chitral fever makes its appearance anopheline mosquitoes are few or absent. Indeed, so far as my observation goes, they do not make their appearance in Chitral till the disease is well established. Mosquitoes of the *Culex* genus were not suspected as transmitters, and for this reason they were not used for experimental purposes, nor were their habits closely observed. Sandflies, on the other hand, are plentiful both at the commencement and all through the course of the epidemic. Their appearance, distribution, and disappearance corresponds in a most striking way with the onset, course and termination of an epidemic. They are not found above 7,000 ft, nor is Chitral fever. I devoted a great deal of time and labour to experimentation with these insects but with uniformly negative results. I have remarked, in my original account of the disease that, "The very great difficulty of working with sandflies may be, in part, responsible for the negative results." My experiments consisted in the introduction of the hand and forearm of the subject into a specially constructed box, containing sandflies. The sandflies were made to bite a sufferer from this disease in Dosh, after which the box was taken to a camp at a height of 7,500 feet, and some four miles behind Dosh, where the disease did not prevail, and there applied to the hand and forearm of a susceptible individual. The sandflies almost invariably died on the journey, and in those cases where they did survive and bite, no results followed. Experimentation with such minute insects must

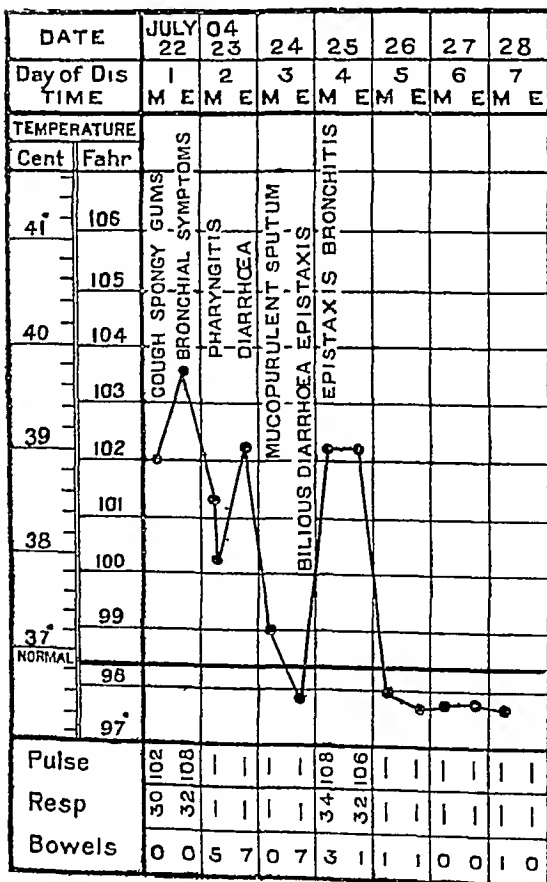
* Schenbe, Diseases of Warm Countries

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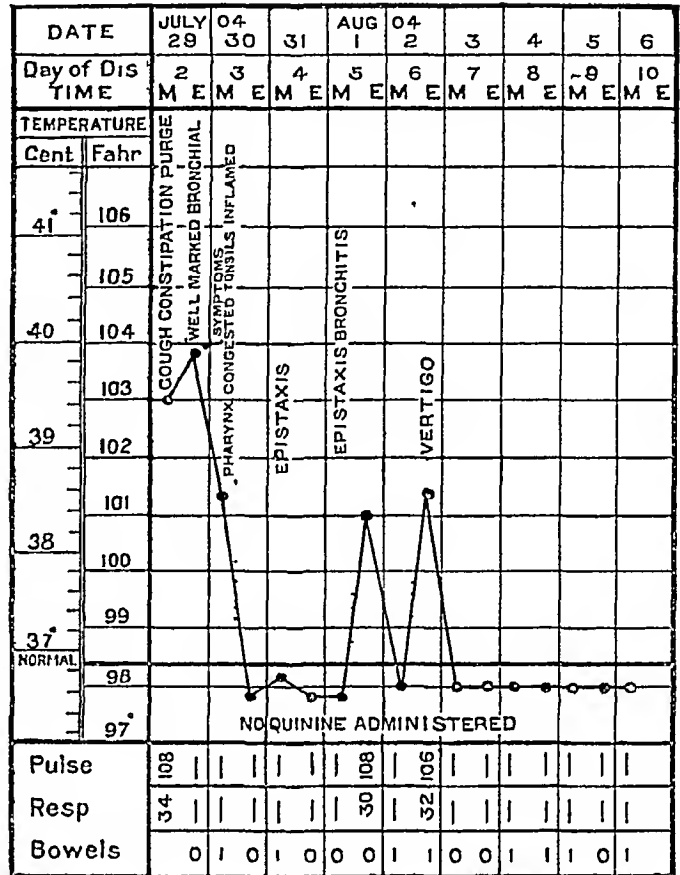
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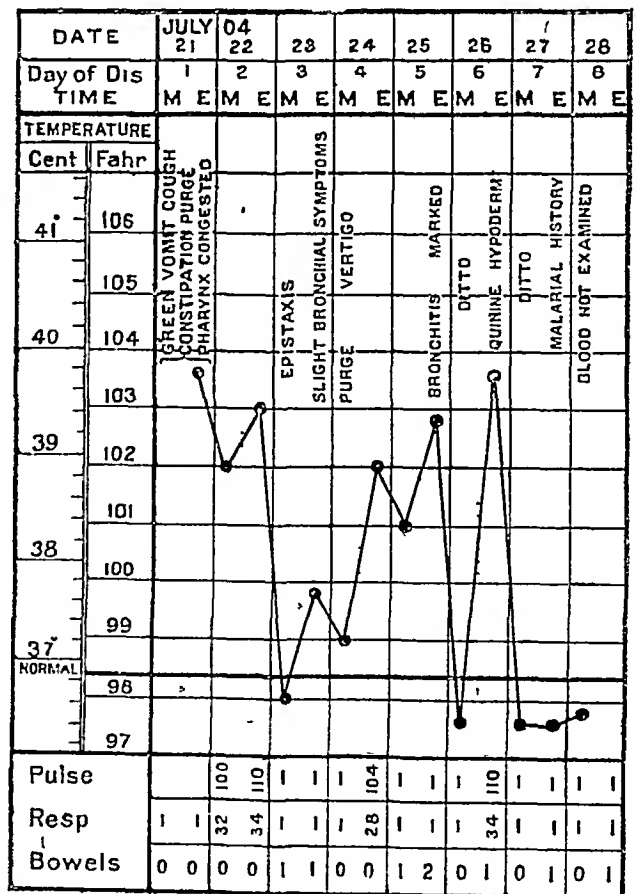
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VII



of necessity be attended with many difficulties, which only experience of their habits of life can obviate. As in the case of my blood inoculation, experiments with sandflies should be repeated.

Ashburn and Craig are, in the case of dengue fever, of opinion that "The parasite causing dengue does not undergo any cycle of development within the mosquito, unless it be a very short one, we are, therefore, of the belief that the parasite of dengue is one capable of living in the stomach of the mosquito for unknown period of time, that infection may occur at any time after the insect has ingested blood containing the parasite, and that it is introduced into man when the insect bites, being regurgitated through the oesophagus and proboscis with the fluid of the stomach." If this is true of dengue, it is possible that the sandfly may be the temporary receptacle of the organism of a disease which presents in its etiology and symptomatology so many points of similarity to dengue, it is as likely to be so as the mosquito. The point is, at all events, worthy of further investigation, and both insects should be used in the enquiry.

While I have here referred to the possible influence of suctorial insects in the transmission of Chitral fever, the facts bearing on the possibility of dust infection must be borne in mind. These facts, as I have drawn attention to them, are —

(1) The good results which follow ordinary disinfection measures

(2) The high percentage of all cases in which an inflammatory condition of the throat occurs, *viz.*, 67%, suggesting an infection by the inhalation of infected particles of dust. I have, at the same time, to point out that the men were provided with sandfly-proof nets in 1903 and 1904, and that, in 1903, the destruction of mosquitoes was practised.

7 PERIOD OF INCUBATION

In the case of dengue, Ashburn and Craig fix this period, on an average of their results in experimentally produced cases, as three days fourteen hours. Manson considers that one to three days is near the truth. Scheube is of opinion that the maximum duration of the period is not more than four or five days, but that it usually lasts one or two days only, often only a few hours. Such a brief period of incubation is not admitted by Ashburn and Craig. In Chitral fever, the incubation period lies between a few hours and five days, in rare cases six days.

There is no such striking difference in any of these statements as to present a point of distinction between the two diseases under consideration.

8 IMMUNITY AND SUSCEPTIBILITY

The general trend of opinion is, according to Ashburn and Craig, that "almost every one is

susceptible, and that an attack of dengue produces immunity for a short time only." On this point, however, the statements of authors are most conflicting. Scheube considers that "no immunity is afforded by a previous attack," while Manson holds the opinion, that "as a rule, susceptibility to the disease is exhausted by one attack."

With regard to Chitral fever, I have remarked that "it appears evident that a degree of immunity is acquired by one attack, and that this is, in the majority of cases, complete (80% of all cases in Goolkhas), in the minority (under 16% in Goolkhas) not sufficient to prevent the occurrence of a second, and, in rare cases, of a third, attack in one epidemic." There is also considerable evidence to show that immunity thus acquired is sufficient to protect the individual in succeeding epidemics, and that for a period of some years. Concerning susceptibility to Chitral fever, I have found that almost all Europeans and Goolkhas are susceptible, younger men, however, much more so than older, Madrassis are much less susceptible, Punjabis relatively immune. The comparative immunity, in these latter races, is probably one which has been acquired, and affords some evidence that the disease, described as the three-day fever of Chitral, is not peculiar to that country.

9 SYMPTOMATOLOGY

Ashburn and Craig remark of dengue — "It is of cardinal importance in considering the symptoms and diagnosis of dengue to bear in mind the fact that it presents, in different epidemics and in different individuals in the same epidemic, a variety of clinical pictures, and that, while there is what is called 'typical dengue' there are many variations from the type, and there is no symptom which can be said to be pathognomonic or even constant, if we except fever." This announcement does not detract from the difficulty of my survey, for, Chitral fever would appear to possess features more constant than the disease to which I have set myself the task of alluding. This, however, may be said of Chitral fever, that if it is a variation from the typical attack of dengue, it is a variation which remains constant in succeeding epidemics. It does not revert to its original type, nor does it present, in different epidemics, or in different individuals in the same epidemic a variety of clinical pictures. I have remarked, when speaking of the variations in severity of cases of Chitral fever, that although some variation is admitted, "the observer cannot fail to notice the almost exact similarity of all cases of the disease."

It will be interesting now to determine, if possible, whether Chitral fever can be considered as conforming to the type of dengue, as it is described by authors, or whether there are grounds for regarding it as a variation from that type. And here I shall follow Ashburn

and Craig's account of the symptomatology of dengue

Invasion—The description given by these authors of the invasion stage of dengue is one which applies with equal truth to Chittal fever. For the sake of completeness, however, there are certain points worthy of comment, and these may be tabulated as follows—

DENGUE	CHITTAL FEVER
Catarrhal symptoms	
(1) Coryza—not present	Not present
(2) Bronchitis—not present unless as a complication	Present in 17% of cases, in most of these as a complication
(3) Pharyngeal catarrh—not present	Present in 67% of cases
(4) Cough—not present	Present in a majority of cases
(5) Sore throat—rare	Frequent

Fever—This being the only pathognomonic symptom of dengue, it is that in which the resemblance between the two affections should be the most marked, if we are to consider the one as being identical with the other, it is here, however, that the lines of similarity diverge most. It will be convenient here, also, to tabulate the comparison instituted—

DENGUE	CHITTAL FEVER
(1) "In the majority, the fever reaches its maximum in 24 hours"	"Within 24 hours the temperature has reached its height"
(2) "The primary rise may exceptionally be 105°F, or even 106°F, usually it reaches to about 103.5°F"	The primary rise "not infrequently reaching 104°F, but as a rule just falling short of the former figure"
(3) "By the end of 24 hours the temperature has usually fallen 2°F, and the period of intermission has begun. In some cases, the drop in temperature is delayed until the beginning of the third day." Quite exceptionally the same high point may be reached on 4 or 5 successive days	After the temperature has reached its height, that is, after 24 hours, a fall occurs. This fall may be of the nature of a remission, but it is very exceptional that after it the temperature should again rise to its former maximum. This fall may be the beginning, and, as a rule, it is of the decline of fever to normal, a decline which in this case takes place during the second and third day. Where the fall on the second day is a remission only, and a rise has again occurred, the decline takes place during the last 24 hours or third day of the paroxysm. In some cases, a slight rebound of never more than 1° or 2°F takes place just before normal is reached.
(4) "The fall having carried it to normal, or only as low as 100°F, 101°F or 102°F, there it remains usually until the fifth day, when it again rises to almost as high a point as its early maximum"	There is no return of fever. The temperature reaches normal after 72 hours, in rare cases after 84, and having reached normal, it remains there.

Ashburn and Craig record the observation, that "critical discharges do not usually attend the fall of temperature, though profuse sweating may occur." In Chittal fever, there is frequently at this stage, hæmorrhage from the nose, more rarely diarrhoea, sweating or vomiting.

Chittal fever, then, presents this essential deviation from the type of fever in dengue, described by these observers, that there is no return of fever on the fifth or sixth day. They acknowledge that "the variations from this typical temperature record are manifold," but hold, that "in the majority of instances, the type may be recognized even through the variations."

If now we turn to Manson's account of the fever of dengue, we find that this author, having described the rise as above, proceeds—"In this condition the patient may continue for one to three or four days, the fever declining somewhat after the first day. In the vast majority of cases this, the first and most acute stage, is abruptly terminated about the end of the second day by crisis of diaphoresis, diarrhoea, diuresis or epistaxis." There is, according to this author, an interval of four, five or six days "when there is generally a return of fever for a few hours, slight in most cases, more severe in others. Sometimes, this secondary fever does not occur, probably it is often overlooked." There is also, with the secondary fever, a return of pains, etc. It would not be difficult to construct, out of the possibilities conveyed to the mind by this description of the fever of dengue, a picture which would resemble closely that of the fever record of Chittal fever, and especially so, as it is acknowledged, that sometimes the secondary fever does not occur, but that probably it is often overlooked. I have, however, little doubt in my own mind that no secondary fever occurs in the case of Chittal fever, and an examination of the 201 charts in my possession has discovered 78 cases, in which the temperature has been recorded for four clear days in the majority of these, and for periods of six to ten days in the minority, after the disappearance of the paroxysm, so that, in these at all events, the return of fever, if such had occurred, could not have been overlooked. There are, however, some few typical charts (9 out of 201) which are worthy of special notice—

Chart 2—Here the fever returned again on the evening of the fourth day, reaching 99.4°F

Chart 3—The fever returned after having been absent for nearly 36 hours

Chart 4—The fever returned after an intermission of thirty-six hours. There are two examples of this in 201 cases

Charts 5–8—Bronchitis was present in all these, and the return of fever may reasonably be attributed to this complication. The termination of the initial paroxysm will be observed to have occurred in all on the third or fourth day.

Chart 9—In this case there was a typical though severe relapse following immediately on the first paroxysm

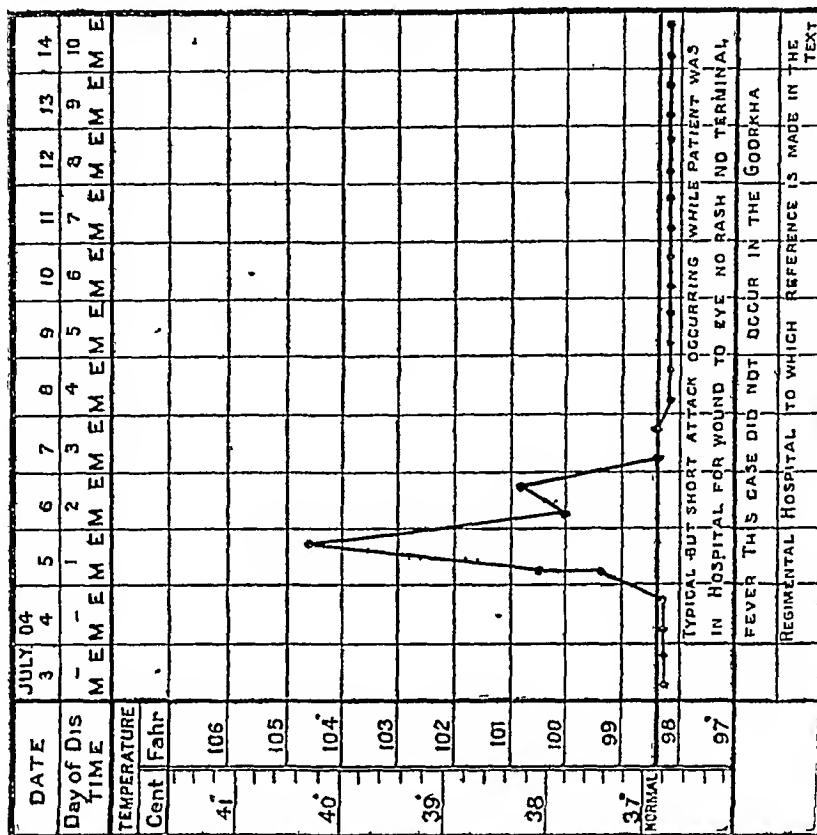
In three cases then, out of 201, there was a slight return of fever after twenty-four to thirty-six hours. Had a rash been present in these cases, they might have been regarded as

ATYPICAL CHARTS OF THE THREE-DAY FEVER OF CHITRAL

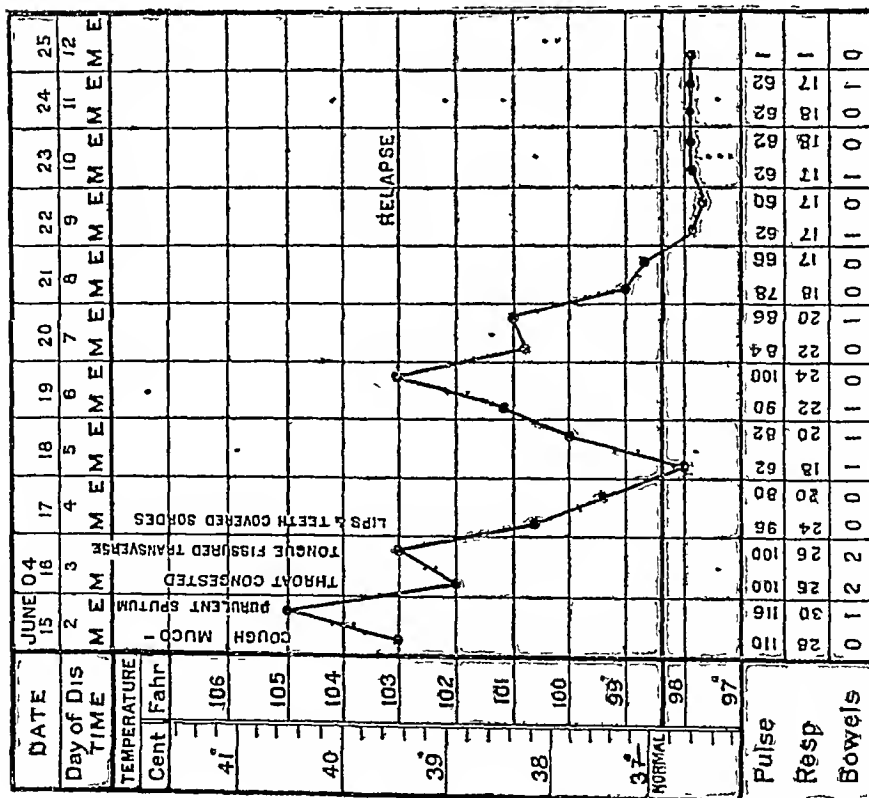
BY CAPTAIN R McCARRISON, M B, B CH, I M S,

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VIII



typical attacks of dengue, as it is, they do no more than accentuate the rule that there is no return of fever after the lapse of an interval during which the patient is free from it.

Chitral fever does not conform to the type of fever in dengue, nor are there sufficient grounds for regarding it as a variation from that type.

Pulse—Gutierrez and Cartaya consider "that dengue shows a tendency to slow pulse." Ashburn and Craig "think that in general the pulse follows the temperature fairly well." Scheube recognizes the tendency to slow. I have drawn attention to the comparative frequency of a diminished pulse-rate in Chitral fever. In both diseases, however, this tendency to slow pulse is the exception and not the rule.

Pain—All the accounts of pain in dengue correspond so accurately to my own account of this symptom in Chitral fever that no further comment is necessary on this point.

Skin Eruptions—"The face is usually flushed, and the eyes injected and watery at the onset of the disease." A statement concerning dengue which applies equally to Chitral fever. In neither case is this initial skin congestion to be regarded as a rash. In Chitral fever the congestion extends also to the mucous membranes. Gutierrez and Cartaya found the skin to be usually hyperæsthetic in dengue. I have commented on Chitral fever, "a certain degree of hyperæsthesia of the skin is not uncommonly present, whilst a burning sensation of the palms and soles is sometimes complained of."

It is estimated that the true rash of dengue is present in 75 per cent of all cases. It appears to be regarded by all observers as an essential symptom. It usually makes its appearance about the time of the secondary rise of fever.

In Chitral fever, this symptom is, like the terminal fever, completely wanting. I, myself, have suffered from this disease on two occasions, the second attack having been milder than the first, but neither in my own case, every detail of which I noted with the utmost care, nor in any of the 800 cases which came under my observation, have I observed a rash which could in any way be considered as an essential feature of the disease. Captain R. P. Wilson, R.M.S., writing to me in August 1903, and again in July 1904, remarked—"I discovered no rash which was typical of the disease," and again, "the clinical symptoms were very like those of dengue with the absence of a rash." Nor have my native assistants ever noted the presence of a rash, then detailed reports of cases constantly contained the entry "no rash."

Desquamation was reported in two cases. I have, personally, never observed it.

Alimentary Canal—The tongue in dengue presents a characteristic appearance. "At first it is covered by a light, creamlike coat which rapidly thickens and darkens in the middle, disappearing from the edges during

the rest of the attack the tongue usually presents a heavy, yellowish central coat with red tip and edges. It remains moist throughout, and shows no tendency to fissure." In Chitral fever "the tongue is coated with a white fur which later may become brownish, the tip and edges remaining red, not infrequently transverse and longitudinal crackings occur" (Temp Chart 9). In dengue, "the appetite is practically always impaired, or absent for the first few days. It returns after this time." In Chitral fever, "the appetite is completely lost, and the sense of taste distorted. It is slow to return, and, in the case of smokers, it is some time before any enjoyment is derived from tobacco."

In dengue, "nausea and vomiting occurred in a few cases, as did diarrhoea." In Chitral fever, "diarrhoea, usually of a bilious character, occurs either at the onset of the fever or at the crisis in 8 per cent of all cases. Vomiting occurred in 8 per cent, it is bilious in character. There is, as a rule, some gastric depression, burning pain in the stomach was complained of in 8 per cent of cases." In both diseases, constipation is the rule.

Nervous Symptoms—These are slight, and confined to an insomnia, which is obviously due to the discomfort caused by the malady, or absent in both diseases.

Hæmorrhages—Gutierrez and Cartaya observed these in one-fifth of all cases, but none from the stomach and bowels. Ashburn and Craig observed none in dengue. In Chitral fever, "hæmorrhage from the nose is frequent (30 per cent), and occurs often at the crisis, less so during the course of the paroxysm." The gums are often spongy and bleed easily. Hæmorrhages from the stomach and bowels do not occur.

Lymphatic Glands—Ashburn and Craig have in dengue, and I, myself, in Chitral fever, observed no changes in these, except those which attend the tonsillar inflammation which sometimes occurs in this latter affection. Other observers have reported enlargements of the lymphatic glands in dengue.

Urine—There is no pathological change in this excretion in either disease.

Convalescence—In dengue, "many writers state that convalescence is often prolonged and tedious." Scheube says of convalescence "it is very slow." Ashburn and Craig did not find this feature of dengue to be present in their cases. A slow convalescence and marked prostration after the attack is one of the most characteristic features of Chitral fever.

Mortality is, in both cases, so slight as to be practically negligible. In Chitral fever, an attack of this disease "so lowers the bodily powers of resistance, that, for a considerable time after the actual attack, the patient is rendered less able to withstand the onset of graver diseases."

The question which at the outset I set myself the task of answering, namely, is the three-day

fever of Chitral dengue? remains still, to my mind, unanswered. I have endeavoured to treat the subject critically, and to weigh the facts impartially, deflecting if anything, the balance of evidence towards the possibility of the identity of the two affections. I find in the two conditions so much that is similar and so little is the dissimilar that the surprise, at the absence of certain features in Chitral fever, is in no way diminished but rather accentuated by the more detailed contrast of the two diseases. In the etiology of the condition and in its symptomatology there are very many factors which are identical with those of dengue, but the record of the former is incomplete, and, with regard to the latter, my failure to find, in cases of Chitral fever, either a rash or terminal fever, both of which symptoms are comparatively characteristic of dengue, renders it impossible, in the present state of our knowledge, to class the two conditions as identical. The diversity of the descriptive accounts of dengue adds to the difficulty of the position. It seems evident that, concerning dengue on the one hand, a more authoritative and detailed account is necessary, while on the other, further investigation of Chitral fever, and of similar single paroxysm fevers of India, is a matter of equal urgency. Experimental observation, along the lines which Ashburn and Craig have followed with success in dengue, and which I, myself, have pursued with failure in Chitral fever, is obviously called for. Chitral fever, should it ultimately prove to be identical with dengue, will be found to resemble this affection as it occurs as an endemic. But till an authoritative account of endemic dengue is forthcoming, till the experimental work to be done in connection with Chitral fever is completed, or, till the organism of this affection is discovered and shown to be identical with, or distinct from the, as yet undiscovered, organism of dengue, the disease must continue to be regarded as a separate entity.

NOTES ON FORSTER'S VACCINE TREATMENT OF DYSENTERY

By W GILLITT,

Captain, I.M.S.,

Superintendent, Midnapore Central Jail

GENERAL interest has been aroused in Forster's vaccine treatment of dysentery, which has given such striking results in this Jail, and, under the circumstances, I think the following illustrative cases may be of interest.

Already cases have been reported in the *Indian Medical Gazette* showing the efficacy of the vaccine in old standing and chronic cases. In this jail the treatment has for some time been applied systematically to all cases of acute dysentery and to test the value of treatment by this method the case mortality has been adopted as a criterion.

The following table shows the case mortality in this jail and all the jails of Bengal for the last seven years —

YEAR	MIDNAPORE JAIL			TOTAL JAILS, INCLUDING MIDNAPORE BUT EXCLUDING SUB JAILS		
	A	D	Case mortality	A	D	Case mortality
1900	166	18	14 4%	5 508	170	3 0%
1901	276	22	8 %	4,955	150	3 0%
1902	371	25	6 7%	4,204	120	2 8%
1903	346	12	3 4%	3,581	89	2 4%
1904	200	7	3 5%	4,123	88	2 1%
1905	290	17	5 7%	2,695	81	3 0%
1906	281	22	8 4%	2,698	81	3 0%
TOTALS	1,930	123	6 3%	27,764	779	2 8%

It will be seen that the case mortality in this jail averages 6 3 per cent with a maximum of 14 4 per cent and a minimum of 3 4 per cent. So far this year the results have been as follows —

Before the introduction of vaccine-therapy—

34 cases with 2 deaths = 5 9%

Since the introduction of vaccine-therapy—

106 cases with 1 death = 9%

This death occurred from *Cancerum Ovis* which set in when the patient was well on the road to recovery.

With regard to the local and general action of the vaccine the treatment gives rise to surprisingly little inconvenience as I can testify from personal experience. Beyond producing a circumscribed tender area on the abdominal wall the inoculations give rise to no trouble.

Nearly 200 inoculations have been given in this jail and I have never seen any ill effects other than the local reaction referred to, and very occasionally a slight rise of temperature for a few hours.

I am indebted to Captain Forster for the bacteriological notes of the cases.

CASE I

M K, et 30

Had an acute attack of dysentery in August and has passed loose motions with blood and mucus ever since 19th November 1907—Kept under observation. Passed loose stools with quantities of bloody mucus.

Inoculated

30th November 1907—Passing normal stools with no blood or mucus.

3rd December 1907—Passing normal stools with no blood or mucus.

Inoculated again and discharged.

Bacteriological notes—No amœbæ or other motile cells. No dysentery bacilli isolated.

CASE II

Wardai Balram Chobe, et 22

History—Has had dysentery for the last two months, disease began with a typical acute attack, many motions of blood and mucus only.

Present condition—Passes 4 or 5 loose stools daily containing small quantities of grumous bloody mucus.

2nd November 1907—Inoculated

16th November 1907—Passing normal stools with no blood or mucus.

3rd December 1907 — Passing normal stools with no blood or mucus

Discharged

Bacteriological notes — 2nd November, 1907 — Mucus contains amœbæ and flagellates. Stools plated on 2nd November 1907 and 4th November 1907. No dysentery bacilli isolated.

CASE III

Convict No 7027, æt 22

History — Had an acute attack of dysentery at the beginning of the year in Balasore Jail. Was admitted to hospital in Midnapore Jail on 22nd July 1907, and was ultimately discharged cured. Admitted again on 4th November 1907, passing many stools of bloody mucus with tenesmus and griping pain. Temperature 100.4°. Inoculated on 4th November 1907.

6th November 1907 — 28 watery stools with blood and mucus

7th November 1907 — 20 watery stools with blood and mucus

8th November 1907 — 24 watery stools with blood and mucus

Showing signs of collapse

Stimulants given

9th November 1907 — 24 watery stools with blood and mucus

Agglutination risen to double that on admission

10th November 1907 — 22 stools. Tenesmus and griping not noticeable

11th November 1907 — 11 motions with mucus and blood

12th November 1907 — 13 loose motions with a little bloody mucus in some

13th November 1907 — 9 formed stools, with trace of mucus

14th November 1907 — 9 semi solid stools, no mucus

18th November 1907 — Inoculated

19th November 1907 — 3 formed stools, no trace of mucus or blood. Since then he has passed formed stools without mucus or blood, general condition is rapidly improving.

Treatment — During the first three days was given Mag Sulph after which stimulant treatment was entirely relied on.

Bacteriological notes —

22nd July 1907 — Shiga's bacillus isolated

7th November 1907 — Shiga again isolated

No amœbæ or other motile cells

CASE IV

Convict No 9208, æt 51

Previous admissions — 26th November 1902, 27th March 1903, 8th July 1903, 3rd July 1906. Present admission on 8th July 1907.

9th July 1907 — 15 loose stools with blood and mucus

10th July 1907 — 13 loose stools with mucus

11th July 1907 — 11 loose stools with mucus and blood

Complaints of great pain in abdomen

Patient weak and showing signs of collapse

Stimulants

12th July 1907 — 14 stools with blood and mucus

Inoculated

13th July 1907 — 15 stools with blood and mucus

14th July 1907 — 9 stools with blood and mucus

15th July 1907 — 15 stools with blood and mucus

16th July 1907 — 17 stools with blood and mucus

17th July 1907 — 7 stools with mucus

18th July 1907 — 28 stools with mucus and some blood

Has thirst and hiccough

Inoculated again

19th July 1907 — 22 stools with mucus and blood

Pain in abdomen less

20th July 1907 — 14 loose stools, some of them containing mucus and a trace of blood

21st July 1907 — 13 stools with mucus and blood

22nd July 1907 — 12 stools with mucus and blood

23rd July 1907 — 12 stools with mucus and blood

24th July 1907 — 21 stools with mucus and blood

Hiccough

25th July 1907 — 14 loose stools with mucus and blood

Inoculated

26th July 1907 — 12 slimy stools with trace of blood

31st July 1907 — 7 slimy stools with a trace of blood

1st August 1907 — 6 formed stools with a little mucus and a trace of blood

From this date onwards he passed formed stools without mucus or blood

Inoculated again on 24th August 1907 and discharged from hospital

On 6th September 1907 he was readmitted, passing loose motions with mucus and a trace of blood

Inoculated

7th September 1907 — 14 loose stools with mucus, no blood

8th September 1907 — 15 loose stools with trace of mucus, no blood

From 9th to 14th passed semi solid stools with no mucus or blood

From this date he continued to pass formed motions without mucus or blood until his discharge from hospital on 11th November 1907

Bacteriological notes — On his first admission the mucus swarmed with amœbæ and flagellates

Stools plated, and Shiga's bacillus isolated

On the second admission the mucus swarmed with amœbæ but contained no flagellates

Stools plated, no dysentery bacilli isolated

Treatment — On first admission, Mag Sulph for first three days and then stimulant treatment, together with Bael powder and Ipecac

On second admission, Mag Sulph for first two days, then Ipecac

CASE V

Convict No 7271, æt 33

Admitted to hospital on 8th June 1907, passing blood and mucus with no faecal matter

He gave a history of a previous attack two years ago

Progress of case — Continued to pass blood and mucus up to 17th June 1907

From 18th June 1907 to 21st June 1907 — Passed formed stools, but all containing mucus

On 21st June 1907 — Inoculated

From 22nd June 1907 to 28th June 1907 — Passed formed stools with diminishing amounts of mucus

From 29th June 1907 to 11th November 1907 — Passed perfectly normal stools without a trace of mucus and was discharged from hospital

Bacteriological notes — No amœbæ or other motile cells. Stools not plated

CASE VI

Convict No 7250, æt 21

No previous history of dysentery

Admitted to hospital on 5th July 1907, passing many watery stools of blood and mucus, no faeces

5th July 1907 to 13th July 1907 — Continued to pass blood and mucus

From 14th July 1907 to 30th July 1907 — Passed stools all containing mucus

From 1st August 1907 to 4th August 1907 — Passed normal stools

From 5th August 1907 to 20th August 1907 — Passed mucus with every stool

From 20th August 1907 to 24th August 1907 — Passed normal stools with no mucus

From 25th August 1907 — Passed stools with quantities of mucus. Inoculated

From 26th August 1907 to 1st September 1907 — Passed stools with diminishing quantities of mucus

From 2nd September 1907 to 7th October 1907 — Passed normal stools with no mucus

Discharged to Post Dysenteric Gang on 7th October 1907

Inoculated again on 25th September 1907 and 9th October 1907

Bacteriological notes—No amebæ or other motile cells

Bacillus Shigæ isolated

CASE VII

No 7267, æt 20

Continuous history of Dysentery every year

Weight 101 lbs on admission to hospital on 11th May 1907, passing blood and mucus mixed with fecal matter, great pain in Sigmoid flexure

12th May 1907—14 stools with blood and mucus

13th May 1907—20 stools with blood and mucus
Inoculated

14th May 1907—16 stools with blood and mucus

15th May 1907—17 stools with blood and mucus

16th May 1907—20 stools with blood and mucus

17th May 1907—15 stools with blood and mucus

18th May 1907—20 stools with blood and mucus

19th May 1907—16 stools with blood and mucus

20th May 1907—12 stools with blood and mucus

Great improvement, blood and much mucus less

From 21st May 1907 to 23rd May 1907—Blood and mucus steadily diminished

From 24th May 1907 to 27th May 1907—Passed no blood and a diminishing quantity of mucus in each stool

Inoculated a second time on 25th May 1907

From 28th May 1907 to 1st June 1907—Passed formed stools with no blood or mucus

From 13th June 1907 to 17th June 1907—Passed small quantity of blood stained mucus with each stool

From 18th June 1907 to 11th July 1907—Passed formed stools with no mucus or blood

Discharged from hospital to Post Dysenteric Gang

The patient was an opium eater, gr XII per diem, and of very poor physique. He was regarded as a hopeless case before inoculation

Weight on discharge from hospital to P D Gang 102 lbs. Weight on discharge from P D Gang on 10th September 1907, 123 lbs. Present weight, 128 lbs.

Bacteriological notes—The mucus swarmed with amebæ. *Bacillus Shigæ* also isolated

THE HIGH MORTALITY DUE TO CHILD-BEARING AMONGST BURMESE WOMEN

By J ENTRICAN,

MAJOR I M S,

Civil Surgeon, Meiktila

ANY one touring through the Districts in Burma and examining the village Death Registers, can hardly fail to be struck with the large number of deaths amongst women, attributed to "Meeyat Yawga" or "Menstrual Disease". Under this head are included all deaths directly or indirectly due to child-birth, all diseases accompanied by disordered menstruation, cancer, probably bladder diseases, and in fact, any disease in women, which is not obviously something else.

General enquiries led me to believe that the first-mentioned cause, *i.e.*, child-birth, formed a very considerable proportion of the whole, and to clear up this point I began collecting statistics from Village Registers. The result has more than confirmed this belief, for the number of deaths due to child-birth has been found to exceed expectation.

Out of 12,331 deaths investigated 1,115 were registered due to "Meeyat Yawga" in women between the ages of 15 and 50, or in other words 90 out of every 1,000 deaths. There were also 124 deaths registered as due to this cause in women over 50 years of age, but these have been left out of account.

The average number of deaths per thousand, in women between 15 and 50, has been 155, during the last four years, so that 90 out of 155 deaths have been due to "Meeyat," or in other words 58 per cent. So far the statistics are perfectly clear, nearly 60 per cent of all deaths amongst women between 15 and 50 are due to "Meeyat," but what proportion of these deaths are actually due to child-birth? This is a much harder question to answer.

At first an attempt was made to investigate all deaths registered as "Meeyat," but this was given up, for one could rarely get any clear history, if more than a few months had elapsed from the date of death. The general impression resulting from these enquiries led me to believe that about three-fifths of the deaths were due to child-birth and two-fifths to other causes. To obtain more reliable evidence an enquiry was made into every death which occurred within three months, prior to my visit to the village, for then it was usually possible to get a fairly clear account of the illness.

Following this method 100 cases have been investigated.

The numbers are smaller than could be wished, but even these have taken nearly two years to collect. The following is an analysis—

Deaths at child-birth	15
" within 3 days	10
" " 10 "	16
" " 1 month	7
" " 6 "	15
Deaths in which no, or at most a very vague connection with child birth could be traced	37
TOTAL	100

Of the children 29 were either born dead or died very soon after birth. Thus, 63 deaths registered as "Meeyat" could be traced to child-birth, and 37 had no apparent connection with it.

If these figures be taken as holding good in general, 63 per cent will give the percentage of deaths in women, directly or indirectly due to child-birth.

This represents a loss to the country at large, of probably 10,000 lives per annum, the lives of women in their prime.

Such a death rate is many times what it ought to be, and its chief cause is an ignorant and barbarous system of midwifery. As an example of what *may* be done, the following will serve—Late one night when touring in an out of the way part of the District, I was asked if I would go and see a woman who had

been two days in labour. The house was a couple of miles away, and on arrival my assistance was unnecessary, as the child had just been born. On enquiry as to the method adopted, I was told that a heavy man had jumped up and down on the woman's abdomen. I suggested an examination to see if there were any injuries, but no one would hear of this—now that the child was born every one seemed quite satisfied. I heard later that the mother died some days afterwards, the child as far as I know survived.

Whether the pelvic measurements of the Burmese women are proportionately as large as those of European races, I am unable to say, but as a race, the former strike one as being very narrow across the hips. This appearance, however, may be the effect of their costume. Certainly one sees an extraordinary amount of distortion of the head amongst newly-born infants, as if their entrance into the world has been attended with considerable difficulty. Judging by the descriptions given and the few cases which came directly under my notice the cause of death in a very large proportion of cases was septic infection, and when the absence of any attempt at cleanliness, to say nothing of asepticism, is considered the result is not to be wondered at. When recovery took place it was frequently found that the unfortunate woman had become a chronic invalid owing to extensive pelvic inflammation. Thus, the evils attendant on the present practice of midwifery cannot be gauged merely by the number of deaths it causes, other more remote effects are produced, which must lead to much suffering and loss of health. Even when nothing abdominal happens, a healthy handsome girl married at 18, becomes a withered careworn woman long before 30, as the result of two, three or more confinements.

The remedy for this state of affairs seems far off, but a beginning might perhaps be made by training one woman from each of a number of selected villages. A respectable woman, preferably a widow, might be sent for a few months to some training school, during which time she should be paid sufficient to support herself and her children (if any) comfortably. On completion of training and return to her village, a small monthly stipend might be given, on condition that she attended any midwifery cases requiring her services at the usual village rate of remuneration.

It is essential that the woman should belong to the class she will be called upon to attend, and be prepared to work for the fees it can afford to pay. Consequently no educational standard whatever should be required, ordinary intelligence and commonsense, in neither of which Burmese women are deficient, should be the only necessary qualification.

Any attempt to secure educated women will defeat the object in view, for such women will

not be content to work for the remuneration ordinarily given by the class we wish to benefit, but will be attracted into the larger towns by the prospect of higher fees.

In these latter the advantages of European methods are now being recognised and in many cases followed.

Perhaps some such scheme as that outlined above might help to put an end to the stupid, cruel customs still followed by the country folk.

SOME PRACTICAL NOTES ON THE USE OF RUBBER GLOVES

By ARTHUR NEVE, F.R.C.S.,

Kashmir Mission Hospital

IN India with dirty patients and ill-trained assistants the surgeon needs every possible help towards the attainment of complete asepsis. The skin of the Indian ryot requires an extensive course of scrubbing, shaving and antiseptic poulticing to remove the accumulated top strata, but fortunately it is more tolerant of friction and chemicals than that of his Aryan cousin in the West. More difficulty is likely to be experienced from the operation assistants, who seldom grasp the principles of asepsis, and are not over conscientious in carrying out even those minutiae which they do understand. But for our own locally trained men most of whom have been many years with us, I must say that, with the introduction of high-pressure sterilisers, and a complete outfit in the way of operation coats, aprons, towels and rubber gloves, there has been corresponding carefulness in attending to the laws of surgical cleanliness.

Gloves are not necessary to the surgeon who only does one or two operations a day, and who has careful assistants. Five minutes spent in cleaning up the hands and a bowl of dilute antiseptic in which to rinse them during the operation are sufficient precautions. But if a surgeon has to spend hours operating on a series of cases, some of which are already septic, the more he endeavours to complete the full ritual of scrubbing and soakings between each case the more will his roughened and fissured epidermis become unsightly to his friends and dangerous to his patients. But if, having cleaned his hands thoroughly and dried them on a sterilised towel, he puts on dry gloves, his skin is then protected however numerous the subsequent washings and however strong the solutions he may need to use, while the smooth nonabsorbent surface minimises the risk of contamination from handling unsterilised articles, and the gloves act as a constant reminder against promiscuous use of his hands.

I began using gloves five or six years ago. The first rubber ones were far too loose, were clumsy and quickly got damaged, then only real value was for the native assistants who

helped with sponging I then tried thread gloves, using them only in special cases. They were comfortable, but did not prevent one's skin from becoming sodden, or from contamination by septic fluids.

The present rubber gloves admirably fulfil their purpose. There are three thicknesses, the strongest being suitable for dressing, handling instruments and sponging, while the medium thickness is suitable for ordinary operations. It is important that they should fit well, and for this purpose one needs a smaller size than for kid gloves, $7\frac{1}{2}$ instead of 8, or 7 instead of $7\frac{1}{2}$.

The cost is no longer prohibitive, a few years ago they were five or six shillings a pair, now only about half-a-crown. This is an important factor for the life of gloves is short. We have purchased about twenty pairs in two years. They have been used in not more than 12 per cent of our total operations, say, in 1000 operations, and to a much less extent in the dressings, so the cost would scarcely be 1 *pice* per operation.

When beginning to work with gloves they were more frequently damaged than after some experience in the art of putting them on and manipulating. It is fatal to allow any loose fold of the rubber at the end of a forefinger, or to attempt to use a finger to guide instruments in the deeper parts of a wound, as for example, in passing Macewen's needle in hernia operations.

It requires a little practice to avoid tying the tip of a glove into a ligature, or catching it in forceps, or perforating it with a needle. But such damage is not irrevocable, a little bicycle solution and a deftly applied patch fits it for use again. Even a small tear endangers asepsis unless the hands have been sterilised before putting on the gloves. For this reason if the operation is a short one the gloves may be filled with a weak antiseptic solution, and slipped on to wet hands.

If daily boiled the life of gloves will certainly be shortened, and the rubber becomes soft and sticky if oil or lysol, etc., gets on to it, so after use they should be cleaned with soap and water and dried, or kept in a solution of carbolic acid. Three minutes spent in cleaning the gloves, with their smooth non-absorbable surface, on which lotions of any strength can be used, is more efficacious than twice the time spent upon the skin.

This makes them of special value when going from case to case and dressing in the wards.

I should like to hear from others how rubber gloves stand an Indian hot weather. One pair lasted me for three months at Amritsar in the cold season, and somewhat infrequent use, as I do not put them on for eye operations. But I presume that in hot climates they would last well if frequently used, and with the occasional application of glycerine. Anyhow the expense would not be prohibitive if one pair only lasted for a dozen operations instead of for 75 accord-

ing to our experience here, that would only mean $2\frac{1}{2}$ annas per operation, a low cost for the additional safety to one's patient and in many cases to oneself. Sad deaths like that of Moir of Calcutta emphasize the need of such protection when doing septic operations. When performing nerve stretching or tracheotomy in leprosy or syphilitics, I protect my face with a mask of antiseptic gauze as well as my hands with gloves. Moynihan and others lay special stress on the value of gloves in abdominal operations, and in hospitals where they are used, it has been noticed that stitch abscesses become rarer, and that the pulse and temperature run a more level course. For myself I must confess that they detract slightly from speed, and so far dull the sense of touch that I do not put them on when searching for a foreign body, or examining the condition of a bone with osteomyelitis, or in obstetrical cases when feeling the state of the os. Such limitations are not numerous, and when all the drawbacks are recognized it is evident that gloves fulfil a real function and have come to stay.

P S—If rubber gloves are punctured or slightly torn they can be mended with a patch cut from an old glove and fixed with bicycle solution, or a new finger may be similarly put on.

It is convenient to have the different pairs marked with consecutive numbers, to identify for use for various purposes.

A Mirror of Hospital Practice

ELEPHANTIASIS OPERATIONS

AN IMPROVED METHOD OF GRAFTING

BY F P MAYNARD, M B, F R C S

LT COLONEL, I M S,

Surgeon Superintendent, Mayo Native Hospital, Calcutta

AS the results—immediate and remote—at the Mayo Hospital in operations for elephantiasis of the scrotum and penis, have improved since the practical point here described was introduced, it may be as well to publish it so that others may give it a trial.

Cases are prepared as is usual elsewhere, reliance being placed mainly on repeated scrubbing with soap and water, after shaving, and thorough soaking with mercuric iodide in rectified spirit (1 in 500). No cold is used, as the larger the vessels, the easier it is to seize them with pressure forceps before dividing them. They are twisted not ligatured. The foreskin is seized with two pairs of catch forceps before dividing it, and the removal of it up to the corona is not done until the wound has been completely closed and only the grafting remains. The difficulty in keeping the grafts from getting displaced by

the dressings, especially when variations in the size of the penis occur, first suggested the idea of not applying any dressing at all over them. On being tried, it was found that the grafts took very well, but that there were risks incurred in leaving the penis uncovered, from movements of the patient, rubbing of clothes—even when a cradle was carefully used—and from flies or mosquitoes, so I devised a wire gauze cage to be used over the penis, which was shown at the Asiatic Society of Bengal (Medical Section) in March 1907. The case (fig 1) is a cylinder

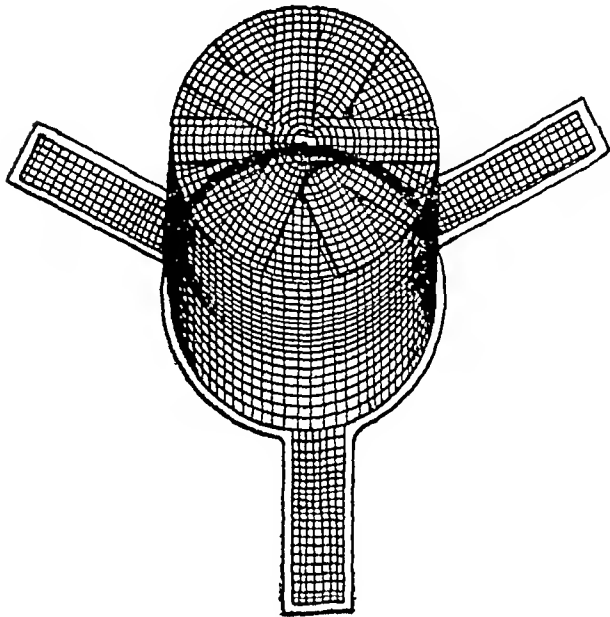


FIG 1

measuring 3" by 6" long, with three limbs at its lower end, one of which passes towards the perineum, and the other two obliquely upwards and outwards from the pubes and which are held in position by apertures of a bandage after the dressings have been applied. It is necessary to have a separate bandage for this, as the cage has to be removed for passing the catheter almost every twelve hours. The edges are bound with tape. The cage is applied at once and used for 24 to 48 hours, when sterilised vaseline is applied on lint over the firmly united grafts. The grafts swell up rapidly and look like pieces of fat bacon on the penis, covered by epithelium. They are usually applied longitudinally. One difficulty in applying grafts is that as the penis shrinks in size, they get wrinkled up and pushed away from the under surface of the root where it is particularly desirable to keep them if the penis is to be serviceable as a sexual organ. To prevent this, the penis is always bandaged—as soon as the cage is removed—with its tip upwards towards the navel and not allowed to fall downwards until healed. Latterly an attempt has been made to keep the penis elongated and in an erect position by taking a clove hitch with tape round the corona and fastening the ends to the upper cage wall higher up than the end of the

penis. This answered well in the two cases in which it was tried (fig 2). Perhaps, by lightly

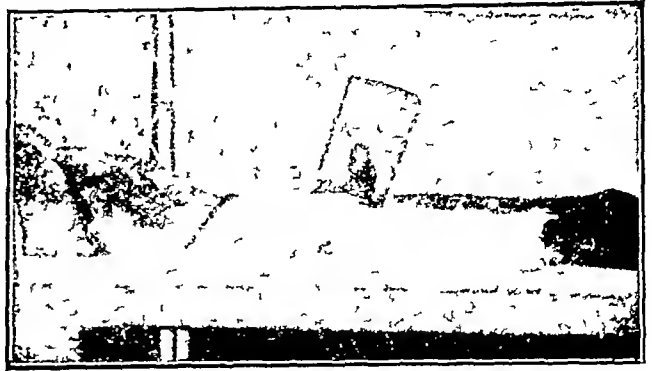


FIG 2—Patient in bed the day after operation, penis slung up to side of cage, no dressing on the grafts. Right thigh bandaged where grafts were taken. Large cradle turned down to foot of bed.

tying a rubber tube round the base of the penis it would be possible to keep it in a state of passive congestion, *z.e.*, erection, for a day or two, so as to provide a larger area for grafts. Anyone who has seen the unsightly results and heard of the sexual misery caused by failure of the grafts, will admit that every effort should be made to make the grafting as extensive and perfect as possible.

TWO CASES OF SPLENECTOMY*

By H P DIMMOCK,

LIEUT COL, I M S

Case I—Splenectomy for prolapsed spleen, causing acute intestinal obstruction

Miss M L, aged 23, was admitted into the Petit Hospital, on July 6th, 1906, for pain in the abdomen, severe vomiting and symptoms of acute intestinal obstruction.

Previous diseases—She suffered from attacks of fever with rigors off and on. Three years back, she was operated on by Colonel Collie for movable spleen which was sutured up to the abdominal wall in its original place. Four months after this operation she noticed pain in the splenic region, caused accidentally by a kick from a child. In April, 1906, she again noticed the tumour in her abdomen, but on the right side. About the same time she had an attack of diarrhoea.

Origin, duration and progress of the present complaint—During the week of her admission into the hospital, she had pain in the abdomen and vomiting. The pain gradually grew worse, so also the vomiting, which was at first green but afterwards became yellow. She was admitted into the Hospital in a more or less collapsed condition owing to acute intestinal obstruction, and it was decided to perform an exploratory operation at once.

* Being a paper read at the Bombay Medical and Physical Society.

Operation, 6th July, 1906—A linear scar of the previous operation, performed by Colonel Collie, was visible on the Linea Alba. An incision was made half an inch to the left of the scar close to the umbilicus extending about 6 inches lower down. It was carried through all the layers of the abdominal wall down to the parietal peritoneum, which was felt to be thickened and adherent to a hard tumour beneath it. A small incision was made at the level of the umbilicus on the thickened peritoneum, and dark coloured blood began to well up from the wound, showing that the peritoneum was firmly adherent to the tumour beneath. So the incision was extended 4 inches further up to reach the non-adherent part of the parietal peritoneum. The abdominal cavity was opened and the tumour was found to be spleen. It had contracted adhesions not only with the greater part of the parietal peritoneum, but also with the intestines in three places. The adhesions were broken down with great difficulty, and in the attempt the parietal peritoneum had to be excised in several places. At this stage the capsule of the spleen gave way and a severe hæmorrhage followed, which was stopped by compressing the root. At one place the serous layer of the intestines, about an inch in length, was denuded off, in the attempt to separate the adhesions. This was subsequently repaired with Lambert's sutures. The pedicle of the spleen then being defined, a silk ligature was applied and the spleen was excised.

Next the cause of the obstruction was found in a mass of adhesions to the right of, and posterior to, the spleen pedicle which had formed a band a little above the level of the umbilicus, and through this band a greater portion of the bowels had slipped. Besides the loop of the bowels was found twisted on its own axis. The volvulus was then reduced and the loop of the intestines was made to retine its course. Some dark coloured patches were seen on the surface of the intestines. These patches greatly improved in colour before the abdominal wound was sutured up, the peritoneal cavity was washed out with saline solution and the wound was closed with through and through silk-worm gut sutures.

During the operation two saline rectal injections and two hypodermic injections of æther and digitalis had to be given.

After operation the pulse was 160 per minute, small and feeble. On the fourth day (i.e. 10-7-06) after the operation, she had diarrhoea which was treated with Mist Bismuth and Morphia. On the 15th July, 1906, sutures were removed. She steadily improved and made an uneventful recovery. She was discharged cured on 22nd August, 1906.

The blood count on 18th July, 1906, did not show much variation in the number of blood corpuscles. The red blood corpuscles were 4,800,000 per c mm., and white blood cells could

not be counted owing to light failing. However, the percentage of the different leucocytes counted was as follows—

Polyneuclears	70.3 %
Lymphocytes	10.8 "
Large Mononuclears	14.8 "
Transitional Mononuclears	1.6 "
Granular Eosinophiles	1.6 "
Eosinophiles	0.9 "

Recent inquiries from her friends show that the patient leads quite a healthy life, suffering neither from any enlargements of lymphatic glands nor any digestive trouble.

Case II—Splenectomy for Malarial Splenomegaly

Chinni Govind (H), aged 30, was admitted into the Petit Hospital on 20th December, 1906, for a tumour in the abdomen.

Habits of life—She has lived on a mixed diet and has smoked.

Family history—Her father died 10 years back of fever. Her mother and husband are healthy and living.

Menstrual history—Nothing abnormal, but for the last twelve months she did not menstruate.

Obstetric history—She has had three children. The first was child still-born when she was 18 years old. A year after the birth of the first child she gave birth to a second child that died three days after birth. A year after that, she gave birth to a daughter who is healthy, living and nine years old.

Previous diseases—Except on occasional attack of fever, she has enjoyed good health.

Origin, duration and progress of the present complaint—The present complaint is of a year's duration. It began with fever with rigors which lasted for a month. During that period she noticed a tumour in the left hypochondrium, which enlarged gradually and extended downward and forward to the right. She used to feel feverish daily in the evening, since the first attack of fever which lasted for a month.

State on admission—She was a young woman of about 30, fairly developed and poorly nourished. She was emaciated, and had a languid and depressed look about her. Her skin was pale, sallow, dry and unhealthy looking. She was rather anæmic. There was no œdema about her body or puffiness about her face. Both the conjunctivæ were slightly yellowish. She liked to sit up on her bed. There were patches of dark pigmentation on her tongue.

Digestive system—Tongue was slightly furred, flabby, pale and indented at the margin. Patches of black pigmentation on the sides. She had anorexia. She could take only a little quantity of food. Her bowels at times were loose and frequent.

On inspection of the abdomen, it was found distended unequally. The veins on the abdomen were prominent. She had several scars caused by branding.

On Palpation.—A tumour was felt and the skin over it was moveable. It occupied almost the whole of the left side of the abdomen. In the middle line it began from the epigastrium angle and its right margin descended obliquely towards the right side, 2 inches to the right of the umbilicus, where a big notch could be felt. From this point, it was obliquely directed to the left iliac region, just above the pubis. Its lower margin was rounded. It was not very hard to the feel, especially at its lower border. No thrill could be obtained.

On percussion it was dull all over. The dullness was continuous with the splenic dullness.

The liver was slightly enlarged, about $\frac{3}{4}$ " below the costal arch. Its upper border began at the lower border of the fifth rib. The intestines were all pushed to the right side of the abdomen, which was tympanic on percussion.

Respiratory system—Normal except that the breath sounds were feeble.

Circulatory system—The heart's impulse was visible in the 4th intercostal space, instead of the 5th. Heart sounds weak. Pulse soft, weak and compressible, about 88 per minute.

Urine—No albumen or sugar.

Diagnosis—It was diagnosed to be an enlarged malarial spleen. The patient was greatly inconvenienced by the considerable increase in the size of the spleen. She had anorexia and at times suffered from diarrhoea, moreover, she stood in imminent danger of rupture of the spleen by the slightest injury, and it was, therefore, decided to remove the spleen.

Operation—Splenectomy was performed on 27th December, 1906. The abdomen was opened up, as usual, in the middle line by an incision extending from the umbilicus to an inch above the symphysis pubis. As the abdominal walls were greatly thinned out, the peritoneum was reached with the first stroke of the scalpel. On cutting open the peritoneum, the slate coloured spleen came into view. It was aspirated with a hypodermic needle but only a few drops of blood were removed. Owing to the enormous size of the spleen, the incision had to be extended above to an inch below the ensiform cartilage. On exploring the surroundings of the tumour, it was found adherent in several places to the parietal peritoneum in front as well as to the mesentery about midway between its root and its intestinal border. The adhesions were broken down between clamps and ligatured. The adhesion to the mesentery was similarly broken down, and the cut margins of the peritoneum were sutured up with fine silk with Lambert's sutures. The spleen being freed from its adhesions was brought out of the abdominal cavity with great difficulty, as it had a very short and broad pedicle which was clamped in two places. Then the pedicle was transfixed with two silk ligatures. The splenic vessels were well secured and ligatured. At this stage of the operation, the capsule of the spleen

gave way, and there was severe bleeding, which was, however, stopped by pressure with sponges, and digital pressure. The pedicle was then cut between the clamps and the spleen removed from the abdominal cavity. All the bleeding points were secured and ligatured. The abdominal cavity was swabbed out and irrigated with saline solution, and the wound was sutured up with through and through sutures.

During operation a pint of saline was injected per rectum and a hypodermic of æther and digitalis given. After operation her pulse was very feeble and small, 100 per minute. Temp. 99°.

Sutures were removed on 10th January, 1907.

Blood count on the 8th January, 1907, showed the number of R. B. C. reduced to 2,500,000 per c. mm., and W. B. C. increased to 10,000 per c. mm. The patient did not allow the second blood count.

All the time she was in the hospital, she had a temperature varying between 99° to 101°, rising, sometimes going up to 102° and 103°. She was treated for this temperature with quinine injections. Also quinine with arsenic and iron was given by mouth, but it did not affect the temperature.

Except this rise in temperature her general condition greatly improved. She had a good appetite. Her look became more intelligent and she became less languid and depressed. The colour of her skin greatly improved. She had no enlargements of lymphatic glands during her stay in the hospital. She had diarrhoea on the third day after the operation, but it was soon cured by Mist Bismuth et Morphia. She asked for discharge persistently on the pretence of going to her native place for her daughter's marriage, so she was discharged on 25th February, 1907. Nothing has been heard about the patient since her discharge.

Splenectomy for hypertrophy of the spleen is now a fairly common operation, and may be undertaken in those cases where the size of the spleen is causing great discomfort and pain, and is evidently seriously affecting the already greatly impaired health of the patient and where, of course, all other methods of medicinal treatment have failed. It is notable that other cases of splenomegaly might be benefited also by removal. The first case reported by me is unique, one similar to it is reported by Webster in the *J. Am. Med. Sc.*, 1903. In this case the tumour was situated in the right iliac region and was adherent there. The symptoms of intestinal obstruction which complicated my case, make it, I should say, absolutely unique. My second case was one that is commonly met with in malarious countries. Rodolpho Schwartz reports ten cases of operation under similar circumstances and many interesting features are noted by him. The condition that induced him to operate was that of movable spleen and all his cases were, women, in whom movable spleen is much more,

common than in men I do not think there is anything very special to remark about the operation. A median incision high up is of course the usual line of operation though it can be done by the incision for splenopexy, *viz*, to the left of the left rectus.

The most important point is to secure the bleeding points, especially those connected with small adhesions, of which there are often very many. Those under the arch of the ribs are frequently, I believe, overlooked and cause fatal oozing after operation. It is no use doing anything but tie them. As regards the physiological or pathological effects of removal of the spleen, the two cases did not show enlargement of the glands or much change in the condition of the blood corpuscles.

These observations were not, however, carried out thoroughly owing to the objection of the patients.

NOTE ON THE TREATMENT AND DIAGNOSIS OF GONORRHOEA IN WOMEN

BY C. BRODRIBB, B.S. (LOND.),

CAPTAIN, I.M.S.

MANY medical officers in military employment, more especially those in charge of Cantonment hospitals, are responsible for the diagnosis and treatment of a large number of cases of gonorrhoea in women. And since a number of these cases are among prostitutes in Cantonments, the responsibility is no light one, and presents many difficulties.

In the first place, information given that a prostitute is a source of infection is more often false than not, secondly, if a prostitute has gonorrhoea she will take all measures to conceal the fact, as for example an astringent douche before being examined.

Lastly, it is a disease which in its subacute stages is particularly difficult of detection, even routine microscopical examination of secretions being far from satisfactory, in that it is very easy to find no gonococci in an undoubted case of gonorrhoea.

For these reasons I think that the following remarks may be of interest to some Cantonment hospital Medical Officers and others, they being the result of a careful study of these cases during the nine months that I have been in charge of a Cantonment hospital.

As regards the difficulty in diagnosis, I need not discuss here the obvious case with a purulent discharge showing in the vagina, these, if comparatively rare, are easy of diagnosis, it is the case with a somewhat reddened vulva or vaginal mucous membrane, with perhaps a plug of clear mucus in the os which makes one think whether it is safe not to take her into hospital.

For these cases I have had an instrument made; it is the shape of a small fan about three-quarters of an inch broad, slightly curved on the flat, and set on a handle.

If one remembers that in the majority of cases the vaginal mucous membrane is not infected, the discharge simply lying on the squamous epithelium which is destitute of glands, and that the places of infection are the endocervix, the urethra and the ducts and glands of Bartholin, then this instrument will be found very useful.

The nymphæ having been separated, the situation of each Bartholin's gland is expressed towards its duct, "the expresser" is then inserted into the vagina, and the whole length of the urethra expressed towards the meatus, lastly, a duck bill speculum is inserted with its lip in the posterior fornix, then the instrument is placed in the anterior fornix and the cervix expressed between the two, if there is any pus in these canals it will be seen on expression at the orifice, also pus in these situations is not easily got rid of by a self-given douche.

If pus is found in any one of these situations the case may be safely diagnosed as one of gonorrhoea, but slight redness of vagina or vulva especially if small or a plug of clear mucus expressed from the cervix are not considered to be sufficient signs for admission, though these cases may be given one day's treatment as described below, and a week's daily douching to be on the safe side.

As regards treatment I have for some time now adopted the following method with most gratifying results—

The vagina having been douched with cyllin (half a dram to the pint), a duck bill speculum is inserted, the cervix seized in a vulsellum, and equal parts of pure cyllin and glycerin rubbed into the endocervix with a dressed Playfair's probe, a similar probe soaked in 4 per cent sol cocaine is now passed the whole length of the urethra, equal parts of cyllin and glycerin are now applied to the whole length of the urethra. A mark one and-a-half inches from the end of the probe is useful to indicate how far it need be passed to ensure treatment of the whole urethra, the same mixture is applied to the orifice of the ducts of Bartholin if these show signs of infection. Lastly, the whole vagina and vulva, especially the latter, is swabbed out with a cyllin solution of a dram to the ounce.

After this treatment they have a cyllin douche (half a dram to the pint) twice daily, and I repeat the treatment after three days, only on one occasion have I been able to find pus at the second setting and that was a case in which the ducts of Bartholin were infected, and this case was cured after the second application, however, for safety's sake, they are kept in hospital a fortnight, and may get a third and perhaps a fourth exhibition of this treatment.

It is surprising how little pain this method of treatment causes, at most a little burning sensation on micturition for one day.

Indian Medical Gazette.

JANUARY, 1908

ANNUS MEDICUS, 1907

THE year 1907 has passed away without any striking advance in Medicine or Surgery. Possibly the extended knowledge and use of the methods of vaccine therapy, brought into notice by the original genius of Sir Almroth Wright, is the most important advance in medicine of the past year.

In India with which we are chiefly concerned the year has been a somewhat disturbed one, and political troubles, followed by high prices, scarcity and famine, and serious railway strikes paralysing trade have rendered the year 1907 a memorable one. Plague has remained, now in its eleventh year, as bad as ever. One hopeful feature is that, as a result of the work of the most recent of plague Commissions, our knowledge of this fell disease has improved and following on a gracious letter from the King-Emperor, the local Governments have all issued resolutions indicating the steps taken or about to be taken to grapple with the terrible evil. That the rat and the rat-flea sum up the whole of the ætiology of plague we are not prepared to maintain, and we cannot believe that the only method of infection is an abrasion of the skin and the scratching into it of the infected excreta of the flea. It is impossible to deny that this infection by rat-fleas is the only proved method and we think it right that on these lines plague should be fought. Nevertheless, we cannot avoid thinking that there are more than one source of infection, and it is probable that the predominance of one source or the other varies in different places or at different times. We are of opinion, therefore, that much more research is wanted and that it is a thousand pities that the recent Commission which had done such good work should have ended so early, we were going to say so prematurely. Surely there was much for it to do, the immunity of Eastern Bengal or many parts of Madras are matters yet unexplained. The distribution of the rats themselves is far from known, for example, at one time we were told that *Mus rattus* was the chief rat concerned, but Hossack soon showed that *Nesokia Bengalensis* was the chief factor in Calcutta, and a footnote to say that *M. decu-*

manus includes *N. Bengalensis* is an inadequate acknowledgment of this change of view. We only mention this to emphasise our opinion that still further research is needed.

We need monographs on the fleas and rats of other parts of India, such as the handsome memoir on rats, published for Dr. Hossack by the Indian Museum.

We have already expressed our opinion on the piecemeal way this valuable plague report is being published in an expensive English Quarterly, instead of by the Government of India. One result being that the report has been long delayed and another, that there is observable a tendency to attribute the credit of the work to certain institutions in England, when we all know that the work was chiefly done in the Bombay Laboratory by Major Lamb, Capt. Glen Lister and their Assistants. The press in England have not hesitated to severely criticise the Government of India on many occasions. It is all the more necessary, then, that it should give the credit for the good work done by the Commission to the persons who deserve it and to the Government of India who have paid for it.

We again direct the attention of our readers to our special plague number for this year, as announced in our issue for October last (p. 383).

Our columns have dealt with many other matters of great interest during the past year. The appearance of cerebrospinal fever outbreaks in several towns in the British Isles has directed attention to this formidable disease. The appointment of a Committee on blackwater-fever and the deputation of Dr. C. Bentley to investigate this disease, one of the factors of the unhealthiness of the Duars, is a step taken at the urgent solicitation of the Tea Association. The recent outbreak of beri-beri in the Tea gardens of the Darjeeling hills, its appearance in a school at Kurseong and in the Reformatory at Alipore, Calcutta, as well as several cases at Howrah, have given observers in this part of India an opportunity of studying this mysterious disease, hitherto in Calcutta confined to the Chinese community and to *lascars* on the steamers in the river.

Various papers we have published throw much light on the vexed question of the identity of Dengue with the "Seven day fever" of Leonard Rogers, I.M.S., and the "three-day fever" of Chittul which has been long recognized by many medical men and fully described by Capt. McCarrison,

whose last paper on the subject we publish in this issue

The widespread prevalence of Malta fever in India has been shown by papers published by Major Wimberley, Capt Spawson and Capt Biayne, I.M.S., but it has not yet been recognized as an indigenous fever in the two Bengals, in Burma or Madras. Papers by Capt Kenrick, Dr Landon and Capt Percival Mackie have shown the widespread prevalence of relapsing fever especially in Western India. Our correspondence columns have recorded an animated discussion on the use and value of quinine used hypodermically.

A paper by Capt D McCay, I.M.S., the Professor of Physiology in Calcutta, has raised the important question of the nutritive value of the diet scales in use in the Prisons and Asylums of India and we hope the matter will be further investigated.

Turning to the surgical side, we have had many good papers published. On the question of cataract there has been much to say on the merits of the operation of extraction in the capsule, which is associated with the wonderful work of Major Henry Smith of Jullundur, whose energy has raised a small mofussil dispensary into the largest cataract hospital in the world. The subject of hydrocele has been treated at great length in our columns this year and the operation introduced by Lt-Col J J Pratt, I.M.S., Civil Surgeon of Fyzabad, has been shown to be the best operation for this complaint. Several papers on the vaccine therapy of dysentery indicate that the special work of Capt Foister, I.M.S., is likely to be attended with great success and that there is strong hope that we may soon have a reliable method of treating the tedious and often fatal forms of chronic dysentery.

Several valuable papers have also been contributed on the practical question of the disposal of sewage in cantonments, and there is hope that in the incinerators recommended by Surgeon-General H Hamilton, C.B., I.M.S., we have found a safe and ready means of safely disposing of night-soil in cantonments.

The establishment of the medical branch of the Asiatic Society of Bengal has given Calcutta a Medical Society it has long needed, and we have been glad to report the proceedings of this Society as well as those of the Medical and Physical Society of Bombay and the South India Branch of the British Medical Association.

We have also recorded the opening of the South India Pasteur Institute at Coonoor, and the formation of a scheme for a similar much needed Institute for Burma. The opening of a new Medical School in Burma is another advance, and the new College of Medicine for Lucknow is at present under construction, and we hope the Hon'ble Colonel R D Murray, I.M.S., will soon be able to arrange for its opening.

At home we have had the establishment of a new United Services Medical Society, which if, as seems now likely, its scope is enlarged, will fulfil a useful purpose in bringing together the men of the Navy, Army and Indian Medical Services. The newly formed Tropical Medical Society in London will also be found useful by men at home on study leave.

The new rules for study leave have been largely availed of and have proved very popular. We hope soon to hear that similar arrangements will be made to extend similar privileges of post-graduate study to men in the Military Assistant Surgeons' service and to the various classes of Assistant Surgeons and to those useful officers called by the very inadequate name of Hospital Assistants. The Hospital Assistants have been drawn together by the formation of an All India Hospital Assistants' Association, which, if worked on sound lines, is destined to do great good. Turning now to service matters, especially concerning the Indian Medical Service, we have to record the passing of orders which have materially improved the position of junior officers in the Jail departments. No change has been made in the pay of Civil Surgeons, and there is an increasing feeling that in these days of diminishing private practice the pay of highly and expensively educated medical men compares unfavorably with that of the Police and other departments, and this is the more felt as the most recent orders about the "fee question" have given rise to very considerable dissatisfaction, and it is felt that the matter cannot remain in the position it now is.

The sketch of the history of the Indian Medical Service from the able pen of Lt-Colonel D G Crawford, I.M.S., has been very much appreciated, and it has given our readers a résumé of orders on many points as regards leave, pay, and pensions about which considerable ignorance prevailed. The great grievance as to pension remains still unsettled, that is, the absence of a pension between the 25 and 30 years. The R A M C has such a pension, at 28 years.

service, and we think that the matter will never be satisfactorily settled till there is an additional sum of £40 per annum added for each year's service after 25 years*. If this were permitted, it would be largely availed of and it would seldom be necessary to grant extensions of service with the consequent block in promotion.

A gratuity at 10 or 12 years' service to men who have broken down in health or who wish to retire thus early would also be much appreciated and would meet many hard cases.

The Indian Medical Service has suffered severely during the past year by the deaths of many distinguished men. Among the Veterans we may mention Sir Joseph Fayrer, and among the younger men we have lost D. M. Mon, H. Whitchurch, Fullerton, Dyson, and more recently Turnbull, all able men and representative of the medical service at its best. The loss of such men as Mon, Fullerton, and Turnbull from blood-poisoning contracted in the discharge of their duty is very sad and emphasises the dangers of the profession.

Men of the service have been busy too in writing books, new editions have been called for of Waddell's Edition of Lyon's *Medical Jurisprudence*, and of Newman's practical book on *Aseptic Surgery*. The appearance of Leonard Rogers' book on *The Fevers of the Tropics* marks an epoch in our increasing knowledge of the fevers of India. Major W. D. Sutherland's admirable book on *Blood Stains* fills a real want and is sure to be largely appreciated.

Among the forthcoming new books will be that on *Ophthalmic Operations* of Lieut-Col Maynard, F.R.C.S., of Calcutta, another by Capt H. Gidney, I.M.S., on *Eye Operations*, and one which will be eagerly looked forward to, by Major Henry Smith, I.M.S., on the *Jullundur Operation for Cataract*. Major Ewen's book, *Insanity in India*, is also in the press and will be of great use to all medical officers.

Tropical medicine has been well catered for during the year by the appearance of the magnificent volume on Tropical Diseases in Allbutt's *System* (Vol II, pt 2), and the new edition of Manson's splendid little volume.

We must not forget to put on record the advance made by the publishers of the *Indian Medical Gazette* by allowing men in the subordinate branches of the medical department to

subscribe to this Gazette at half price, a privilege which we are glad to see has been largely availed of.

In conclusion we have only to thank our numerous correspondents for the help they have given to make the Gazette a success. We now have among the contributors to our pages a large number of I. M. S. Officers, Assistant Surgeons and Hospital Assistants in Government Service, and we are especially glad to welcome the contributions from non-service medical men, especially the medical missionaries and medical officers of the various Railway Companies.

MALARIA AND EMPIRE DECAY

WE have read with very great interest this little book published by Mr W. H. S. Jones, with added chapters by Major R. Ross, F.R.S., C.B., and Dr C. G. Ellett*.

The chief author, Mr Jones, is a classical scholar of distinction, and his views are, therefore, entitled to respect.

We may agree with much of what Major Ross says in the introductory chapter that widespread disease is an important factor in racial decay and one that has been too little studied by historians. Major Ross does not mean by widespread disease epidemic infections as plague or cholera, but "those endemic diseases which when once introduced oppress for ever" and then rather inconsistently goes on to refer to the decimation of the N. American Indians by small-pox and other diseases introduced, after the discovery of the continent by Europeans, or the devastations of measles in the Andamans or of many Pacific island races by measles, tuberculosis and syphilis. Surely these for a people, without racial experience of them, are "epidemic infections" just as much as plague and cholera are.

Major Ross goes on to show how intensely malarious modern Greece now is, quite half the children examined by him on the Kopais plain a year or so ago were "infected"—and in the unhealthy year 1905 over a million attacks of malaria were reported out of a population of only 2½ millions.

Mr Jones takes up the question of the existence of malaria in ancient Greece, and connects with the prevalence of malaria a

* i.e. £500 at 25 years, £540 at 26 years, £580 at 27 years, £620 at 28 years, £660 at 29 years, and £700 at 30 years.

* Malaria, a neglected factor in the history of Greece and Rome by Jones, Ross, and Ellett. Cambridge: Macmillan and Bowes, 1907.

change in the character of the Greek people in the fourth century B C, a change which however, is not altogether admitted by some historians. We will, however, revert to this aspect of the subject, first we must mention Mr Jones' conclusions. He writes (p 53) —

"Malaria was certainly prevalent, in many parts of Greece, including Attica during the fourth century B C, though Greece was not 'highly infected' in the technical sense of the words as used by Sir P Manson. The evidence of language, and the fact that older people were frequently attacked, suggest that the disease was but recently introduced. The use of the word "*Melanchoia*" and its cognates show that the Greeks themselves noticed the effect of malaria upon character. The change which gradually came over the Greek character from 400 B C onwards was one which would certainly have been aided and was in all probability caused by the same disease."

We may first deal with the question of the existence of malaria in Greece in ancient times, where Mr Jones stands on firmer ground than when he attempts to connect a recent widespread prevalence of the disease with moral and intellectual decay. The most common general term for fever in Greek is *Puretos*, and the first use of the word is found in Homer (*Iliad* xxi, 31), where, however, it, we think, refers to the heat of the "dog-days." In his graphic account of the "Plague of Athens" (430 B C) the careful historian Thucydides uses "*kauma*" or "*Thermè*" to express the "fevers" of that epidemic. Aristophanes in the *Wasps* (1037) certainly refers to the "shivers and fevers which by night strangled your fathers and throttled your grandsires." This play was published in 422 B C, and seems to us to infer that these "fevers" were known for at least three generations past. In the Greek medical writers who date from 400 B C onwards there are descriptions of fevers, continuous and intermittent, and quotidian, tertian and quartan. These show that the types of the malarial fevers were well known in ancient Greece, and (adds Mr Jones) there is a tendency to limit the word *puretos* "fever" to those exhibiting a certain periodicity. Probably so, but this proves nothing. In India to the present day the word "fever" and its vernacular equivalents "*bokhar*," "*zor*," are commonly used to refer to malarial attacks. We have no hesitation in agreeing with Mr Jones that the Greeks of the fourth and subsequent centuries were well acquainted with the malarial fevers, but we must emphasise the fact that as in modern days up till a dozen years ago many

other specific fevers were included in the comfortable and comprehensive term "malaria," so the case must have been in ancient Greece and Rome. In recent years the tendency has been to exclude many fevers from the category of malaria, and we have not completely done this even yet. Take Leishman-Donovan Infection—up till a few years ago thousands of cases of this infection were called "malaria," and in every case where the vital statistics of an Indian village or district have been checked, the result has been to show that malaria as a factor in mortality has been grossly exaggerated. So far, therefore, from following Mr Jones in his attempt to show a widespread prevalence of malaria in ancient Greece, we are rather inclined to conclude that while the frequent references to the periodic fevers, show clearly that while malaria existed and was a well-known disease, yet under these headings the ancient Greek and Roman physicians and laymen included a dozen different diseases, and the "continuous" (*sunechers*) fevers, while sometimes meaning a neglected "remittent" malarial case, very often referred to cases of Malta fever, typhoid or tuberculosis, etc, etc.

In the same way (as our authors point out) English writers of our 16th century, under the influence of Galenic and Hippocratic text-books, used the terms, ague, tertian, quotidian, etc, in a very loose way.*

We may, therefore, admit with Mr Jones that malaria was a disease well known in ancient Greece. But Mr Jones' theory of the correlation of malaria with moral decay needs more than this. He needs to show that malaria was a recent disease in Greece and that its effects were seen not only in physical but also in the moral decline of the people in the century which followed the desolating Peloponnesian War.

What evidence does he produce for the introduction—or at least the increased prevalence of malaria at the time required by his theory?

We may pass over Homer's use of the word *puretos* and interpret this to mean the heat of the dog-days. Mr Jones tells us that Hesiod,

* Crighton (*Epidemics in Britain*) says "Ague in early English meant any sharp fever, and most commonly a continued fever." When Livy, xxii, 23, writes that in the year 203 B C a grave pestilence fell upon the city "which resulted in lingering disease rather than many deaths," we take the words "*magis in longos morbos quam in perniciabiles evasit*," to refer to a disease such as Mediterranean fever with its long tedious course and low death rate rather than (with Mr Jones) to chronic malaria.—ED

a poet of rural Bœotia, does not use the word *puetor*. The word "*Epialos*" used for a fever by Theognis and Aristophanes need not mean "malaria" and for a fever to follow exertion or fatigue by no means shows it to be malarial. An attack or a relapse of malaria may be so exerted in a person already infected, but after fatigue, especially in a hot climate like Greece, the fever might as well be due to sun exposure or heat exhaustion.

Mr Jones refers to the disastrous Athenian expedition to Egypt in 456 B C, and looks here for a possible source for the invasion of malaria, but intercourse with Egypt dates from a period long before 456 B C. Again, our author refers to the island of Sphacteria and the fight there on land and sea between the Athenians and Spartans, and notes that the Bay of Navarino, in which lies the island of Sphacteria, is one of the worst "malaria centres in the Mediterranean." Granting that this may be so—it proves nothing as to the condition of the island in 425 B C. If we turn to Thucydides (IV, 26) or to Grote's Greece (Vol VI, Ch LII), we find that the islet of Sphacteria or Spagia was "untrodden, untenanted and full of wood," and the promontory which forms the northern end of the modern Bay of Navarino was also uninhabited. We may fairly presume, therefore, that the Athenians did not acquire malaria there, the more so as the little fort built by then General Demosthenes caused very little disturbance of the soil—for Thucydides expressly tells us that they had not brought then trenching tools with them.

We are in accord with Mr Jones when he describes the abandoned and uncultivated condition of Attica during the long Peloponnesian War, and we agree with him, rather than with Major Ross, in thinking that land thus uncultivated and undrained might easily become malarious, if not already so.

The other evidence produced by Mr Jones and required by his theory that malaria had but recently become endemic in Attica (during the 4th century B C) is a passage of Hippocrates, quoted by Galen in which *puetor* (fevers) "are included among the diseases to which childhood is especially liable," and on this truism Mr Jones theorizes that Hippocrates was acquainted with other regions in which children were attacked by malaria and older people immune, and that if adults in Attica were attacked, it proved the recent introduction or at least recent widespread prevalence of the disease. We

must, however, define the word "recent" in this connection. If the argument is used that malaria is a "recent" introduction, because not only children but also adults are attacked, then malaria must be a "recent" disease in India, which (as Euclid says) is absurd.*

We need not follow Mr Jones in his interpretation of the Greek word "melancholia" and its cognates as meaning "malaria-infected." This is quite fantastic.

There now remains a consideration of the disastrous effects on the moral character which the authors of this book attribute to malaria. Let us quote a few of the statements made—

On page 33 we read of malaria "as an insidious and demoralising foe." On page 37—"The fact that so large a portion of Greece never reached eminence may be due to the presence of a scourge which seems to blight the energies of its victims." Page 52—"Experience proves that if malaria be endemic among a people there must be a decline—physical, intellectual and moral." Again, page 54—"If any one is still in doubt as to the devastating effects of malaria upon character, he should consult a specialist in tropical diseases, or have a few words with one who has himself suffered from the disease." 111 Again, in the chapter on Malaria in ancient Italy (p. 61) we read "The effect upon the national character was not so profound as in the case of Greece, the most noticeable change being the evolution of savage brutality from sternness and cruelty." Again, p. 85—"Malaria made the Greek weak and inefficient, it turned the sterner Roman into a blood thirsty brute." Again, p. 96—"If it be that the malarial parasite was introduced into Greece during the 5th century B C, it is quite possible for the disease running a practically unchecked course, to have produced the profound deterioration which occurred in the Greek character during the next century and a half."

We are entirely at a loss to account for this very exaggerated idea of the effects of malaria upon a nation. Is anything of this moral deterioration to be observed in any of the many countries in which malaria is and for long has

* It will be granted that the sepoy of the Indian Army and the vast majority of prisoners in Indian jails are adults, yet the last report of the Sanitary Commissioner, India (Table In), shows over 20,000 admissions to hospital for intermittent fever among the sepoys and over 34,000 admissions among the prisoners. These are not statistics supplied by village headmen, but as careful as can well be. Surely, this shows that no reliance can be placed on the theory of adult infection and recent importation.

Again, in the introduction (page 11), Major Ross speaks of "nearly a million people" (being attacked with malaria out of a total population of about 2½ millions. Surely many of this "million" were adults (we read in another page that quite half the children were infected), and if adults, what becomes of the theory of recent importation because adults are attacked. This will not suit Mr. Jones' theory.

been endemic To take one example, is there any *moral* deterioration observable among the people of Central Bengal, or in the people of the *terai* among whom malaria is severe and widely prevalent? We trow not Surely, the decline of the Spanish Empire from the days of Ferdinand and Isabella to the late war with the United States was due not to malaria but to other and well-known causes

And in Greece itself surely the devastating, prolonged and "suicidal" (the word is Mr Jones') Peloponnesian War was one very sufficient cause of the deterioration in the civic virtues of the Greek States

We need not examine the causes of the alleged decline in the Greek character after the great days of Pericles, when Athens was the "Schoolmistress" of the then civilized world The subject has been abundantly discussed by modern historians of Greece, and we may refer our readers to the later volumes of Grote's history, or still better, to the graphic account given of the depopulation of Greece in Finlay's "History of Greece under the Romans"

We have been much interested in this little book and it has given us great intellectual pleasure to read it, but in reading it the fine expression of Renan arose in our mind—*le mot obsesse* We cannot help thinking that the authors of this book have let the word malaria obsess their minds, and have formed an altogether exaggerated idea of the ravages of this single disease

We may fully admit that historians have paid too little attention to the health of nations, but to attribute intellectual and moral decay so largely to a single disease is to carry a theory to extremes, and we think there is as little ground for attributing the decline of the Greek and Roman Empires to malaria as to attribute the change noted in the English nation which is summed up in the expression "Maffekinsin" to the reintroduction of influenza within the past 20 years

Current Topics

VACCINES AND ANTISERA IN INDIA

THE various laboratories in India are occupied in the preparation of different vaccines and anti-sera, which are at the disposal of Civil Surgeons and others working in the country The

following statement concerning these therapeutic agents is, as far as we are aware, correct —

1 *Central Research Institute, Kasauli*, supplies the following —

- (a) *Anti-tetanic serum* — All Military Institutions are entitled to the supply free of charge, other hospitals and medical men are charged Rs 2-4 for a bottle of 10 cc
- (b) *Anti-venomous serum* — This is efficacious for both cobra and daboia venoms, but is of no value for the poison of other snakes It is supplied free of charge to all Military Hospitals, Government Institutions, and Local Fund or District Board Dispensaries All private institutions are charged Rs 4 for a bottle of 20 cc capacity
- (c) *Anti-diphtheritic serum* — This is supplied free of charge to the same institutions as mentioned above (under b) To private institutions a charge of Rs 2 per 2,000 units is made

This Institute also supplies anti-typhoid vaccine, that is to say, a dead emulsion of the typhoid bacillus for use as a prophylactic only

2 *Bombay Bacteriological Laboratory*

This laboratory is chiefly occupied in the preparation of the plague prophylactic, a vaccine for prophylactic use against plague The charge for this is as follows —

Free in the Bombay Presidency, $\frac{1}{2}$ an anna a dose in other parts of British India and 2 annas a dose outside India It also supplies anti-typhoid vaccine for prophylactic use Further, this laboratory stocks the various anti-sera, except anti-venomous serum, for distribution on payment to all who ask This stock is obtained from the Lister Institute, London

3 *King Institute, Guindy, Madras*

We are not aware of any vaccine or serum except small-pox vaccine, being prepared at this Institute

4 *Pasteur Institute, Kasauli*

At this Institute anti-rabic treatment is the principal work For this treatment patients have to attend daily in person at the Institute It lasts for from 10 to 20 days and is free to all

The staff are also prepared to carry out the treatment of any of the diseases which lend themselves to vaccine-therapy after the method elaborated by Sir A E Wright Without going into details we may mention such diseases as —

- (1) Localised tubercular affections, such as tubercular glands, tubercular disease of the bones, joints, etc
- (2) Chronic staphylococcal affections, such as abscess, boils, sycosis, etc
- (3) Sub-acute and chronic dysentery, after the method described by Captain Foister, I.M.S.

(4) Localised infections with such organisms as *Bacillus Coli Communs*, *Pneumococcus*, *Gonococcus*, etc, etc

(5) The following types of infections (clinically) have been put forward by Sir A E Wright as suitable for vaccine therapy —

- (a) An infection where a single species of micro-organism has penetrated into the interior of the body and has established itself in one or more foci, without causing any considerable destruction of tissue or constitutional disturbance, such as finuculosis, tuberculous infection of lymphatic glands, testicle, etc, etc
- (b) Ulcerative type of infection
- (c) Certain infections of the skin
- (d) Infections of mucous membranes and of the glands and ducts which stand in connection with mucous membranes, such as various infections of the middle ear, antrum, nasal sinuses, dental alveoli and salivary glands, coli infections of the intestinal mucous membrane and gall bladder, different infections of the uterus, urinary bladder and urethra
- (e) Infection of sinuses
- (f) Certain mixed infections
- (g) Certain generalised infections, such as Malta Fever and streptococcal septicaemia. For further details, vide *Lancet* (August 17th and 24th, 1907)

The patients would of course have to come to Kasauli in the first instance, but after a short residence there it might be possible to continue the treatment through the local medical man. Accommodation at Kasauli for most classes of likely patients is now available.

b Pasteur Institute, Coonoor

This Institute at present only carries out anti-rabic treatment, which, as at Kasauli, is free to all comers.

MEDICAL FACTS FROM THE RUSSO JAPAN WAR

In *The Military Surgeon* (for September 1907) is an article translated from one by Staff Surgeon A Shucking of the Austrian Army, which is worth reproducing in parts, as it is as yet almost impossible to get at the real truth as regards the losses in the late war between Russia and Japan.

Repeated reports appeared of outbreaks of epidemics, but it is a remarkable fact that no real epidemic took place on either side. Dr Shucking writes —

As far as I can ascertain, the morbidity figures were even better with the Japanese. They too suffered during the heated period an increase of the infectious diseases to 23.4 per M, and in this figure beri beri caused considerable anxiety, as it alone caused 6.5 of the total morbidity. Frequent complaint was also made over the frequency of typhoid and dysentery. Nevertheless none of these diseases ever reached an epidemic extension and the morbidity figures always remained comparatively

favourable. Dysentery and influenza were always mild. Creosote was used as the best prophylactic against the former. Each man received a box containing ninety pills with direction to take one pill early in the morning, at noon and evenings. The most valuable preventive against beri-beri was a change of diet, the soldiers being given in place of rice, barley twice a week and fresh vegetables as often as possible.

It is undeniable that the careful medical service prevented the outbreak of epidemics and it is really wonderful the zeal which was expended to this end. Nearly every house which was to be occupied was first inspected by a medical officer, and if there was any danger of infection, the occupation of the house was prohibited. In suspicious places the troops bivouacked.

In cantonments of long duration separate sanitary commissions took charge which even undertook provisional cannalisations, they disinfected everything scrupulously, using lime for this purpose and in connection with the gendarmerie inspected the inhabitants and their houses. All cases of sickness among the Chinese had to be reported and were under the control of the military surgeons. The gendarmerie rigorously supervised the police of the markets.

The troops were strictly enjoined to use only boiled water, to wear abdominal bands and only to buy such provisions from the inhabitants as had first been inspected by the military surgeons. The intelligent Japanese personnel followed these regulations most scrupulously, and it is no doubt due to this as well as to the fact that the Japanese have a natural trend to personal cleanliness (which never lets an opportunity go by for taking a bath and changing the clothing, that the morbidity and mortality figures in their army were so brilliant).

I now proceed to a sketch of the surgical experiences gained in the Russo Japanese War. The new Russian first aid packet proved admirable and the Russian surgeons think that its greatest advantage lies in its being made antiseptic. The reports are less favourable over the availability of the Röntgen ray apparatus at the front lines. It is reported that owing to the lack of skilled mechanics all of these machines at the field hospitals became in a short time useless although they were of excellent construction (made by the firm of "Sanitas" in Berlin). It is said that by the 13th of February, 1905, only two of these equipments were in working order, one in Harbin and one in Kundzuljan.

The surgical experiences of the Japanese in the war correspond very closely with those of the Russians.

The Japanese lay the greatest stress on the importance of the first aid packet. If well applied, it almost always suffices in minor injuries and very frequently even in severe injuries and can be left on until complete healing.

For this first dressing the new Japanese packet was almost exclusively used (sublimated gauze and bandage in oil paper). The results were excellent. Even the old packet of Dr Kikuchi which consisted of rice straw ashes in a little bag was excellent as a drying and antiseptic packet.

In the *Revue Militaire des Armes Etrangères* the following explanations of the low sick rate in these armies are given —

(1) The rigorous selection of the recruit. (2) The extraordinary salubrity of the north east Asiatic climate and the rarity of malaria. (3) The fortunate geographical and geological conditions which preserve the deep water courses from contamination by the infiltration of superficial and polluted water. (4) The permanent freezing of the soil, waste and excreta during a winter more than nine months long. (5) The abundance and quality of the food supply, due largely to the regular and continuous employment of the kitchen cart. (6) The adaptation of clothing and habitation to the local conditions and climate. (7) The absence of overwork. (8) The absolute prohibition of the sale of alcohol to the soldiers.

THE BOMBAY MEDICAL AND PHYSICAL SOCIETY

THE transactions of this Society for July and August (Vol. XI, Nos. 2 and 3) have recently been received. We propose to publish *in extenso* two good cases of splenectomy by Lt-Col H P Dimmock, I.M.S. Dr T B Nairnan, of the Parsi Lying-in-Hospital, read a practical paper on the treatment of post-partum hæmorrhage. This paper gives a useful résumé of modern English opinion on this matter. Dr Bishop, writing in a recent number of the *Practitioner*, advocated only pressure on the abdominal aorta and the raising of the feet of the bed. Bishop even goes so far as to deny the value of efficient contraction of the uterus, on the other hand, Dr Fitzgerald, a previous Master of the Rotunda, Dublin, argued as follows—

That a clear knowledge of all the causes that tend to post-partum hæmorrhage is necessary for the intelligent treatment of this condition. The natural forces for the control of hæmorrhage, he says, are contraction and retraction of the uterus and clotting. He is opposed to the method of compressing the abdominal aorta on the ground that it is not easy of performance, and can only be done in an hospital where there are many assistants. It is attended, he says by unnecessary and prolonged inconveniences to the patient, and, not being directed towards the removal of the cause of the condition cannot seriously be regarded as a rational method. He questions the influence of the elevation of the pelvis on venous uterine hæmorrhage, especially if the abdominal aorta is compressed. He relies chiefly on the prophylactic treatment or the proper treatment of the third stage of labour. To lay hold of the uterus as soon as the second stage is completed and squeeze and massage it, and then endeavour to express the placenta, and often express it, are the most fruitful sources of post partum hæmorrhage. To this Dr Bishop replies by saying that post partum hæmorrhage is essentially a general practitioner's tragedy, that he has never seen a case of severe post partum hæmorrhage in hospital, and that one or two other consultants of much larger experience of hospitals for women have assured him that they have not seen such cases in hospital practice. In the British Islands alone over two deaths per day occur from these causes, and he considers that sufficient to justify an earnest attempt to put an end to what is an entirely preventable loss of life, due mainly to erroneous teaching upon this subject. His method, he says, requires a bed, a table and the bare fist of the operator, and that these are obtainable in the smallest cottage in England. Dr Bishop can have no idea of what general practice is in India—where, in the majority of houses, you not only do not find a bed and a table, but where you have to work very often on the floor, unassisted by the patient's friends and relatives who would not even touch the patient at this critical period.

And in this opinion Dr Hastings Tweedy, the present Master of the Rotunda, agreed.

Another paper was read by Captain E F Gordon-Tucker, I.M.S., on a fatty heima of the linea alba, which he says are not uncommon in India and may simulate a subacute intestinal obstruction.

Dr N F Soiveyoi, M.D., read a paper on the action of salol and pointed out its use when administered by the mouth in checking the formation of boils. He also uses it, dissolved

in olive oil as an external application to the skin, and found it especially useful in the case of summer boils. Dr A Powell gives the following note on his collection of flukes—

They were specimens of—

- (a) *Dicrocoelium* (*Distoma*) *lanceolatum*, obtained from the gall bladder of a Bangali man.
- (b) *Fasciolopsis* *Buski* (*Distoma* *Crassum*), found by Dr Lindok in an Assamese.
- (c) *Opisthorchis* (*Distoma*) *sinensis*, obtained by exhibitor from a Bangali.
- (d) *Fasciola* (*Distoma*) *hepatica*, also from a Bangali.
- (e) *Schistosoma* (*Bilharzia*) *hæmatobia*, found in the Bombay Morgue in a case dying of rupture of an aortic aneurism. The man was a resident of Bombay, but had spent some years in Persia. This case is interesting, as being the first in which the actual parasite was found in India.

The exhibitor had the fortune to be also the first to find *Bilharzia* ova in a native of India who had never been outside the Peninsula and, therefore, must have contracted the worms in this country. The case, that of a syce who had been for some time with the Boer prisoners in Ahmednagar, has been reported in the *Lancet*.

COMMITTEE FOR THE STUDY OF SPECIAL DISEASES

A COMMITTEE of medical men engaged in practice or in scientific research has recently been formed with the object of making systematic examinations into some of the most important diseases, the pathology and treatment of which is as yet undetermined. The Treasurers of the Fund are Sir W S Church, Bart, Past President of the Royal College of Physicians, Sir Clifford Allbutt, Prof Sims Woodhead, and Dr T S P Strangeways, the Lecturer in Special Pathology at Cambridge. A fund has been started by medical men, and though no public appeal is made, yet subscriptions and donations will be welcomed. Those members of the Committee who are engaged in private practice report to a centre any case of the special disease which may come under their care, number and initials only and not the patient's names are recorded. A small hospital has been opened at Houghton Grove, Cambridge, where patients are received at the request of their medical attendants. At present the special disease under investigation is Rheumatoid Arthritis, or rheumatic gout, and an exhaustive study is being made of its ætiology, pathology and treatment. No charge is to be made to the patient and none of the staff receive any fee. Already nine studies on this disease have been published. For further information inquiries may be sent to Dr T S P Strangeways, Cambridge.

EXCISION OF THYROID TUMOURS

OUR readers may remember a note by Major Henry Smith, I.M.S., in our September number (p 328) on his method of operating for the removal of goitres in which he points out the

danger of chloroform in such cases, and states that he now used as an anæsthetic an injection of morphia and streak of carbolic acid along the line of the skin incision. This experience is in accordance with that of Kocher, and we learn from an article (*Practitioner*, September, p 330) by Mr A E Barker of University College Hospital that this is a not uncommon experience. Mr Barker's method is as follows —

The solution of 2 per thousand of B Eucaine in normal saline is best prepared *fresh*, by adding a powder containing B Eucaine 3 grains, Sod Chlor 12 grains, to 100 c centimeters = $3\frac{1}{2}$ ozs of distilled water in a small hand glass flask, with a mark on the neck showing the amount of distilled water to be used. This is boiled for a few minutes and then cooled to blood heat. To this, when thus cooled, are added ten drops of adrenal chloride solution 1 in 1000. We have then the following solution —

B Eucaine	0.2 grammes
Sod Chloride ..	0.9 "
Adrenalin Sol	0.5 "
Dist Water to	100.0 "

This means two per thousand of B Eucaine and one in two hundred thousand of adrenalin in normal saline, a very dilute solution of two essential ingredients, but purposely weak in order to admit of use in large quantity.

The injection is best done in the ward while the patient lies comfortably in bed. It is made first with a small sharp Freireisen's needle into the skin, not under the skin, all along the line of the curved incision usually employed (Kocher's), Figs 1 and 2. This injection should distribute the fluid pretty widely about the track of the incision, so as to reach all nerve filaments likely to be divided. This will require about 30 c.c. The short sharp needle is then exchanged for a very long one of somewhat larger size. This is closed at the end, which is rounded and polished, and has an eye close to the point. It cannot of course be thrust through the skin itself, but requires a puncture to be made for it with an ordinary suture needle with sharp point and edges. A straight Hagedorn's needle is perhaps the best. This puncture is made in the line already injected, and, by preference, at one corner of the curved incision line. The blunt long needle is thrust through this puncture into the subcutaneous tissue, and is slowly pushed across the neck towards the other horn of the incision, the fluid being injected as it goes (Fig 2). It is then partially withdrawn and pushed outwards and downwards for a couple of inches, and again nearly straight upwards. The fluid thus diffused, which will equal 30 or 40 c.c., will cross the track of most, if not all, of the branches of the cervical plexus going to the area of skin in the field of operation on one side. Then the needle is thrust in the same direction from a puncture at the other horn of the curved incision, and the same process is repeated. The same blunt needle is then pushed between the deeper layers of the cervical fossa round the capsule of the thyroid on both sides, and the rest of the fluid is injected on both sides (Fig 2). For a tumour of moderate size, 100 c.c. are ample, but for larger swellings, up to 150 c.c. may be employed, but this is rarely necessary if the fluid is evenly distributed over the area indicated. The abundant use of a very weak solution with adrenalin produces a good deal of what one may call an artificial œdema, but this disappears before long, and, at the end of from 40 minutes to an hour, the analgesia is at its height, and the œdema is practically gone. Another desirable effect of the injection is the comparative bloodlessness of the whole area of operation. To operate before at least half hour has elapsed since the injection is a mistake where adrenalin has been employed. The secret of good local analgesia is to inject a large amount of a dilute

solution, with due regard to toxicity and to wait a sufficient time before operating.

For the past few months there has been an active epidemic of polomyelitis in New York, and many studies have been made into the ætiology of comparatively rare disease, but without any satisfactory results, the blood examinations have shown that the bloods are normal in spite of every evident sign of extensive involvement of the spinal cord. Many severe forms have been met with and also (says the *Journal A M Assoc*) a large number of exceedingly mild cases. Recoveries have taken place in a phenomenal number of cases.

"At a recent meeting of the pediatric section of the New York Academy of Medicine cases were reported in which there was involvement of all four extremities and some of the nuclei of the medulla. In these cases many patients showed absolute paralysis of the entire body, including a loss of vesical and rectal power, and paralysis of the eye muscles or muscles of the face, and yet complete recovery was established within six or eight weeks. The experience of orthopedists at the Hospital for Ruptured and Crippled, where over 300 cases have been reported bears out this feature of this as well as of other epidemics.

Many of the present cases have presented special features of diagnostic difficulty. This has been particularly true for a number in which the onset has been accompanied by meningeal symptoms. There have been excessive headache, photophobia, intense rigidity with excruciating pain in the back of the neck and pains in the joints and tendons. In the early stages these patients have considered as having cerebrospinal meningitis, and only after the third or fourth day has a positive diagnosis been possible. In many of these patients the paralytic symptoms have been markedly delayed, in some instances appearing as late as from the fifth to the eighth day after the initial onset. Marked hyperæsthesia and pain have been present in many cases, possibly due to a certain amount of mild infiltration about the sensory nerve roots. Bladder and rectal difficulties have not been infrequent. Some of the features of a neuritis have accompanied some of the latter class of cases and suggest the possibility, already touched on by Medin, of a neuritic complication. In fact, the toxic element in a number of the New York cases has been a striking, if not at times perplexing, feature.

The therapeutics of the affection has not yet been so hopefully brought out. Hot baths, with rapid urinary and fecal elimination, seem to give the best results. Counter irritation by means of ice bags to the head and spine, or by mustard pastes, has been extensively used in the present epidemic. It is certain that the hot water baths are useful, relieving the pain and usually quieting the little patients very rapidly. Absolute rest is imperative, and it has been advised that active measures for the paralyzed limbs should not be undertaken too rapidly or too energetically."

We again direct attention to the appeal made by Surgeon-General Blandfoot, C I E, I M S, of the India Office, for funds for the establishment of a Prize in Pathology open to Lieutenants, I M S, and R A M C at the Army Medical College in London. It is very desirable that the I M S should take their proper share in subscribing to this fund, and we hope that many of our Service readers will send their ten rupees to

Surgeon-General Bannfoot at the India Office, London

A NEW feature in this number is the Bombay letter, next month we propose to publish a special article on Motor Cars for Civil Surgeons in India

Reviews.

Fevers in the Tropics Their Clinical and Microscopical Differentiation including the Milroy Lectures on Kala-Azar—By LEONARD ROGERS, M.D., F.R.C.P., F.R.C.S. (ENG.), I.M.S., Professor of Pathology, Calcutta Medical College London. Henry Frowde, Oxford University Press, and Hodder and Stoughton, 1907

THOSE who have known the author of this book and have read the numerous papers he has written of recent years on the differentiation of the fevers of India have long looked forward to the appearance of this book. The indefatigable industry which Major Leonard Rogers, I.M.S., has ever shown alone made it possible for him to produce this handsome volume. It is dedicated to his brother officers of the Indian Medical Service, and on many pages of the book will appear the names of all of them who have taken their share in the differentiation of the fevers of India.

This fine volume sums up for us the knowledge of this first decade of the 20th century on the fevers of the tropics, and is a worthy successor to the other works on the subject, which, as shown in Major Rogers' admirable introductory chapter, have been produced by James Lind, Annesley, Twining, Ronald Martin and other writers of the previous century.

We strongly commend this historical introduction to our readers. It is very pleasant reading, and sketches the fashions of tropical medicine from 1757 to the present day. The struggles over the introduction of emetona, the displacement of bark by violent purging, the days of mercury and salivation, the great advance by Edward Hare, whereby mercury was abandoned and the position of quinine established, the early history of the discovery of typhoid, the observations of William Twining on the "congestive fever of the cold weather" which, by 20 years anticipated the better known work of Jenner, are all sketched here by a master-hand.

Affixed to each chapter is an admirable chronological bibliography, which is as complete as it is useful.

The next portion of the book is an amplification of the Milroy Lectures on Kala-azar, which were delivered by Major Rogers in London during the past year. As these were reported in the medical press at the time, we need not here refer to this section.

At the urgent request of Professor Osler, of Oxford, our author inserted chapters on typanosomiasis, sleeping sickness and yellow fever which are fortunately not Indian fevers, but are very properly included in a book dealing with tropical fevers. They are admirable résumés of the subjects.

The chapter on typhoid fever and the paratyphoids is very good. The question of typhoid in natives of India is fully dealt with, and largely, owing to the author's work and that of others in Bombay, etc., no one now can maintain that the natives are largely immune to typhoid. The whole subject is here dealt with in a very complete way.

A most interesting and useful chapter is that on Indian relapsing fever, which is becoming increasingly recognized as one of the chief fevers of India, and which is practically never absent from Bombay, where the classical work of Vandyke Carter was done, and we hope that the suggestion of Captain Percival Mackie, I.M.S., to give the name *spiroillum carteri* to the Indian variety of the spiroillum, will be generally adopted, as it has been by Manson in his recent book.

Malta fever is well handled, and its prevalence in Northern India and its absence from Calcutta and apparently Madras is commented upon. One practical and original chapter in this book is devoted to the fever of the presupplicative stage of amoebic hepatitis. We all know every case of liver abscess had had a long preliminary treatment for "fever," and the importance of early recognition of the hepatitis is of vital importance. The various classes of cases met with are here clearly described, and this is a chapter which should alone make this book indispensable in every station hospital for British troops in India, where liver abscess is very common, and where its mortality is abnormally high. The value of ipecacuanha, and the necessity of using it before operation, is very clearly explained in this chapter.

Epidemic dropsy is clearly treated, and this is the most up to date article on this disease which, in spite of recurrences since the famous outbreak of 1877-79, has not yet received the recognition it deserves.

An admirable chapter on unclassified long fevers is well worth reading, especially the description of the "low-fever of European immigrants" into Lower Bengal and Assam, a somewhat colourless fever which, however, has a very real existence, and is a separate entity.

Some forty pages are devoted to malaria, and the reader will find this chapter eminently practical. On the subject of treatment Rogers gives his views on the superiority of administering quinine by the mouth rather than hypodermically. A commonsense view is taken of the matter malaria prophylaxis. The bibliography of this chapter is very good.

The subject of dengue is well treated, and also the vexed question of the identity of such fevers as "7-day fever," etc., with an endemic form of dengue. This matter is also discussed in the paper by Captain McCarrison in this issue. Plague is briefly but adequately dealt with, and we commend the excellent chapter on heatstroke and the effect of heat to our readers. We hope that this chapter will give the death-blow to the fantastic theory of Sambon, which would have died long ago had it not been somewhat supported by Sir P. Manson.

The "unclassified short-fevers" form a very useful chapter. That on the incidence of such specific fevers as cerebro-spinal fever, influenza, whooping cough, mumps, measles, etc., is interesting, and a most useful chapter is added on the technique of blood examination in fever.

This book, by Major Leonard Rogers, is one to be very strongly recommended. It adequately represents our knowledge of tropical fevers at the present day. It is a marvel of industry, and represents the work of many years.

It is invaluable as a work of reference and for many years it must remain the standard work on the fevers of the East. The fact that it is dedicated to the I M Service, and that it freely acknowledges and appreciates the work of the officers of that service, will make it the more appreciated by them.

By the publication of this work Major Rogers not only has erected a monument of his own untiring industry, but has reflected credit on the whole service.

Piroplasma Canis and its Life Cycle in the Tick.—By CAPT S R CHRISTOPHERS, M B, I M S, Scientific Memoirs, No 29 Calcutta, 1907 (Superintendent of Government Printing)

In December 1906, we published a preliminary note by Captain Christophers, I M S, on the development of the *Piroplasma Canis* in the Tick. The present memoir gives a full and complete account of Captain Christophers' further work on this subject. The piroplasmata, says our author, apart from their economic importance, possess a special interest for the protozoologist, and the discovery of the nature of the developmental changes which they undergo in the Tick promises to throw light on the relation of the hæmocytozoa to the flagellates, and also to add greatly to our knowledge of the life processes of the pathogenic protozoa. The piroplasmata first became known by the researches of Smith and Kilbourne into the pathology of red-water fever, or "Texas fever," of cattle. The infection is not uncommon though as yet seldom recognized in India. European dogs in India are often affected, and the disease, canine piroplasmosis, has chiefly hitherto been studied in Europe and in South Africa. A map, given on page 35 of this memoir, shows the widespread known distribution of the Tick known as *hippoccephalus sanguineus* (Latreille). Captain Christophers in

this memoir shows that there are two means by which the infection is spread, *viz*, hereditarily through the egg, and stage to stage infection.

We commend this interesting monograph to the attention of all our readers who are interested in the developments of the rapidly advancing science of protozoology. As is usual in this series of memoirs, the get up of the book is excellent, and the illustrations extremely good.

Blood Stains, their Detection and the Determination of their Source.—By MAJOR W D SUTHERLAND, M D, I M S, Bailliere Tindall and Cox, pp XII and 167 Illustrations 20 plain, and 10 coloured. Size Demy 8vo Price, 10s 6d net.

THIS book, as the author states in the Preface, is written with the object of putting at the disposal of the medical profession, the Bench and the Bar, a full account of the modern tests by which the detection of blood stains and the determination of their source may be carried out.

To the medical man, especially to those working in India, questions regarding the identity of suspected blood stains being of frequent occurrence, this work will be of the greatest service.

Hitherto, no such compendium of tests existed to aid him in his investigations.

An extensive knowledge of the literature of the subject, and an intimate practical experience of the work, has enabled the author to fill this great want in an entirely satisfactory way, and to place, in our hands, a book of reference, and a practical guide to the performance of those tests, whose value is established.

Throughout the book, abundant references are made to, and extracts quoted from, the work of investigators of all countries. These extracts, given in a concise way, trace the modifications the tests have undergone, explain the methods adopted, and the opinions held by different observers of great experience, as to the value of the various tests in forensic practice.

The book is divided into ten chapters—

Chapter I is devoted to the solubility of blood stains. The factors of age of the stain, heat and sunlight to which the stain has been exposed, being fully dealt with in separate paragraphs.

Chapters II & III deal with the chemical tests, which have been used for the detection of blood, from the time of Orfila up to the present day.

The Guaiacum test is treated at some length. For the forensic purposes, this test is now looked upon as one of negative value only.

The white foam, which is produced on the addition of peroxide of hydrogen to a blood stain is also regarded as a valuable negative test.

A full description is given of one of the most satisfactory of the chemical tests, *viz*, the formation of hæmatin chloride crystals, by

means of glacial acetic acid in the presence of a trace of common salt

Two good micro-photographs of hæmatin chloride crystals, a table of the various processes recommended by different authors, and a very clear description of a method of carrying out this test which the author has found to give satisfactory results, and greatly to the practical value of the account. The chapter ends with a few short notes on the methods of recognizing, or excluding, vegetable colouring matters, presence of albumen, red or brown aniline dyes, and rust and fruit stains on metal

Chapter IV The spectroscopic detection of blood stains, a most important method, is well described in this chapter

Two excellent coloured plates, of the spectra obtained, are fully explained in the text

Accounts are also given of the various methods adopted for obtaining extract suitable for spectroscopic work

Chapter V is on the use of the microscope in the detection of blood

Accounts of the numerous fluids which have been recommended as suitable media for microscopical preparations are given

The question of stains, caused by the crushing of blood sucking insects, one of importance in this country, is fully gone into in this chapter

Within recent years a vast amount of work has been done on the Serological and Biological tests, as methods of differentiation between human blood and the blood of other animals

In *Chapters VI to X* the author gives a most lucid, and up-to-date account of these tests

The first, "The Agglutinin" test is the outcome of the observation, that when the blood of an animal is brought into contact with the blood-serum of another animal, of not too closely related species, the erythrocytes of that blood become clumped together

The test has not been found sufficiently certain for forensic work

The "Hæmolysin" and "Complement Deviation" tests depend on the specific actions possessed by antisera, produced by the repeated injections of the blood of one animal into the circulation of another

If animal "A" be immunized by injections of the blood of animal "B," an antiserum is produced in "A" which, if mixed with the blood of an animal of "B's" species, will bring about the destruction of the erythrocytes in that blood and in that blood only

On this the hæmolysin tests depends. For example—The antiserum of a rabbit, which has been immunized by injections of human blood, is mixed with an extract of the suspected stain. If the stain be one of human blood, its erythrocytes would be destroyed, and their hæmoglobin pass out into the surrounding medium. If the blood be that of another animal, this would not take place

The objection to the test is the improbability of obtaining, from a dry stain, enough intact erythrocytes to carry out the test

The phenomenon of hæmolysis is produced by the united action on the erythrocytes of two substances, which exist in a hæmolytic (anti) serum, viz., (1) the "Complement," which is present also in normal blood serum, and which becomes inactive on being heated, and, (2) the "Amboceptor" which is only present in an antiserum which has been produced by immunization. The function of the amboceptor seems to be to link the complement to the blood-corpuscle, and so allow the complement to destroy the corpuscle. Now the complement is capable of attaching itself to different amboceptors, plus the substance which was injected into the animal in immunizing it (called "antigen"), and by so doing, to become locked up and, therefore, unavailable to act on a corpuscle

A very small amount of the antigen is sufficient to bring about this locking up of the complement

On this depends the complement deviation test, one of the most delicate of the serum tests

The test is new and still on its trial

The "Precipitation" test also depends on the specific action, which an antiserum, produced by the injection of human serum, has of forming a precipitate when mixed with human serum or an extract thereof

If the antiserum be mixed with serum, other than human, no precipitate will form, except in the case of monkey's serum. By using more dilute fluids, the risk of this error can be greatly lessened

Although the serum tests are such as can only be carried out in a perfectly equipped laboratory, and by a trained observer, the interest in them is general, and the excellent account, given by the author, will be welcomed by all

The book may be obtained from Messrs Thacker, Spink & Co

Physical Methods in the Treatment of Heart Disease—By ARTHUR G. DANPIER-BENNETT
Bristol, 1907, JOHN WRIGHT & Co

We have received an advanced proof copy of this interesting and useful work

The book is one of considerable value to practitioners as a guide in the treatment of a difficult class of cases. It begins by a description of the Nauheim Bath, its indications and contra-indications. Other chapters are devoted to massage, Bertel's heart massage, electrical applications and respiratory exercises. A good and practical chapter follows on diets, solid foods, vegetarianism, indigestion, alcohol, and change of habits. The last chapter is devoted to drugs, and gives valuable instruction as to the use of digitalis, chloral, opium, hemp, thyroid glands, etc. The book is a useful one

The Practical Medicine Series.—General Editor GUSTAVUS P. HEAD, M.D., Professor of Laryngology, Chicago, Post Graduate School Series 1907

Vol IV *Gynecology* Edited by Emilus C. Dudley, A.M., M.D., Professor of Gynecology, North Western University Medical School, etc., and C. von Bachellet, M.S., M.D., Gynecologist to the German Hospital, Chicago, pp 229

Vol V *Obstetrics*, Edited by Joseph B. De Lee, A.M., M.D., Professor of Obstetrics, North Western University Medical School, with the collaboration of Henry D. Roehler, M.D., and Herbert M. Stowe, M.D., pp 243

Chicago The Year Book Publishers Sole Agents—G. Gillies & Co., Glasgow, 1907 Price 5s nett each volume

These two small volumes contain a short résumé of most of the important work in Gynecology and Obstetrics, which has appeared during the year previous to issue

The work has been thoroughly and carefully done and the books contain a large amount of interesting and valuable information. Those portions dealing with operative technique appear to us to be more especially good, the illustrations being well executed, the text clear and explicit.

Practically, all the most important original work in these subjects, which has been published during the time in question, will be found clearly and concisely abstracted in these volumes.

We can most cordially recommend them to all those who are desirous of keeping up-to-date, as an abstract of current literature.

The printing, binding and general "get up" of the work is of a high standard.

SPECIAL ARTICLE

A BOMBAY LETTER

ROUND THE WARDS WITH LT.-COL. QUICKE, I.M.S.

A FEW days ago I was at the J. J. Hospital in Bombay and was very kindly shown round the wards of the above-named surgeon. A few of the cases seemed so interesting as to merit something more than the oblivion into which instructive cases are often allowed to lapse.

The first was the case of a middle-aged man who complained of an ulcer on the sole of the left foot, beneath the great toe. It caused him pain and lameness and for these reasons he sought treatment.

With the any indefiniteness of many native patients he owned that it had troubled him for some few months and incidentally he owned to a tender swelling low down in the neck (in the supraclavicular space) on the same side of the body.

When examined more carefully he was found to have a series of undefined swellings down the same arm as far as the elbow and a similar condition in the right arm. It was noticed also

that the fourth and fifth finger of the left hand were passively flexed into the palm, not actually flexed as they are in Dupuytren's contraction.

There were at least four smooth small tumours in sequence one to each rib from the third to the seventh on the left side, and they seemed to be attached and to take origin from the ribs or from the periosteum at any rate.

When the calf of the left leg was palpated a similar deep-seated globular swelling was made out low down in the ham and beneath the gastrocnemius.

Without going into a discussion of the differential diagnosis let us say right away that the case was one of multiple neuroma, a very very rare disease.

Colonel Quicke operated upon the man and by making a long incision in the track of the big nerves in the upper arm revealed an extraordinary state of affairs.

Following or rather embracing the median and the ulnar nerves and accompanying the musculo-spiral as it dived to its musculo-bony canal was a series of tumours varying in size from a pea or smaller to a horse chestnut. They were strung like beads on a rosary, but the question which was most difficult to solve was whether the nerve trunks acted each as a string to its own rosary or whether it occupied some other position. To put it in pathological terms, did these tumours start from the ends-neurium, the epi-neurium or the peri-neurium? The unaided eye was unable to decide this point so that the operation was not continued to its logical conclusion, for it is obvious that to enucleate the tumours when the nerves were spread out over or through their substance would have been to destroy utterly the nerve trunks and leave a useless arm.

In connection with the musculo-spiral where it left the axilla there was a larger mass of growth and, on examination, this proved to be not a single tumour but a congeries of them, closely packed together, so that one was inclined to look for facets on them so well were they mutually adapted to each other.

The big tumour in the posterior triangle was doubtless composed of a similar collection of small lumps.

The tumours on the ribs were arising from the undersurface of their respective ribs, without doubt from the intercostal nerves in fact, one was so demonstrated as attached to the nerve.

The flexion of the fourth and fifth fingers of the right hand was due to ulnar palsy caused by some change in the nerve trunk caused by the tumours. This nerve as it passed in its groove behind the internal condyle could be rolled under the finger and was the size of a small pencil, a thickening of the nerve trunk, something just short of tumour formation.

The perforatory ulcer, for such it was, on the left foot was due to involvement of the popliteal nerve this time the trophic function suffered,

for there was no evidence of paresis and sensation was little affected

The man is recovering from the operation and we leave him more or less in *statu quo* and go on to the pathological aspect of his case

The tumours which were removed from the arm were set aside, some portion for immediate examination and some for microscopical purposes

They were globular supple and nearly translucent and looked for all the world like skinned 'loquats'. On section a satiny sheet was exposed with the grain in one direction evidently fibromatous but the translucency and the softness pointed to myxomatous change. This was rendered more probable by the examination teased fresh specimens under the microscope and was afterwards proved by the ordinary method of sectioning

The question as to how the nerve fibres were disposed was more difficult and those particular tumours examined shewed no nerve fibrils at all

Some were specially prepared and examined by method well adapted for the display of healthy or degenerate nerve fibrils and some of these shewed small bundles of nerves lying between and alongside the masses of morbid growth

Some of the fibromata shewed isolated nerve fibrils running through their very substance in a longitudinal direction. Many fibrils were healthy but some shewed degenerative changes. These morbid growths therefore were false neuromata, (for even the transit of a nerve through the substance of a fibroma does not make it a true neuroma), they were myxo fibromata or better steel fibromata undergoing myxomatous change

Tumours of nerve trunks are not so very rare but are generally single and nearly always innocent fibromata. The bulbous swellings which appear on the ends of nerves in amputated limbs are not really neoplasms, for they have no tendency to grow large, they are only due to a fibrosis of the cut nerve. Besides the single fibromata of nerves there are multiple tumours on nerves generally of similar structure to the present case but very rarely true nerve tumours composed of ganglionic cells and fibres, occurring just beneath the skin

Then there is the plexiform neuroma which appears as a local hypertrophy and lengthening at a individual nerve trunk. Just as the superficial veins of the calf of the leg, seem to lengthen out and become doubled back on themselves forming knots of varicose veins, so the nerve similarly becomes varicose and gathers itself with knots feeling like a bag of worms beneath the skin

The last form which neuromata may take is seen in the condition some time called Recklinghausen disease or multiple neuro-fibromatosis

This is the well-known condition where the body of the patient is covered with crowds of warts and excrescences of various sizes

These have been shewn to be really fibromatous of the nerve terminals in the skin and are therefore false and not true neuromata

A sub-variety of Recklinghausen's disease is the condition where only one such tumour exists but which becoming oedematous and pendulous and the more pendulous the more oedematous arrives ultimately at the stage at which it almost bears its unfortunate possessor to the earth. I saw one at Mr Jonathan Hutchinson's Polyclinic where the patient could take his ungainly deformity and fling it like a cloak over his shoulder

An interesting problem in the case before us is to say what significance in the paresis of the ulnar nerve and the trophic change in the popliteal had as regards the question at innocency or malignancy

Speaking in general term an innocent tumour does not interfere with the function of a nerve unless the latter is so confined (as in a bony canal) as not to be able to escape the pressure of the growth. On the other hand, malignant growths involve nerves quite early and tumours of the thyroid producing paralysis of the recurrent laryngeal, and, as Mr Butler has so often enforced, tumours of the parotid producing facial paralysis are always malignant

So the involvement of the ulnar and popliteal nerve in our case may indicate sarcomatous change taking place in some one or more of the tumours

The next case was one of atrophic (scirrhous) carcinoma in the full breast of a well developed and well nourished woman of 35

The history is that about a year the breast became very firm and swelled to about the size of the woman's two fists. After some months it became red and painful, an opening formed and a lot of blood and matter came away

It continued to discharge up till quite recently, and all along since the inflammation began the breast has been steadily getting smaller

The patient is well nourished with hardly a trace of cachexia and she has plenty of subcutaneous fat. Indeed she is a well developed woman, and, as native women go, looks younger than her age

The breast is flattened against the chest and no trace of glandular tissue remains. There is a large triangular red area which marks the site of the inflammation and the skin is hard and knotted over it, almost a condition in fact of 'en cuirasse'

The area is hard, painless, bound down to the ribs, and irregular, thickened lines and nodules extend into the axilla where there are a few very small hard glands, a few smaller still are palpable in the supra clavicular fossa

The opposite breast is indefinitely indurated, especially in its sternal portion, but there are no definite lumps

There is no sign of internal growth and the woman is in good general health

Col Quicke excised two fragments, one at the margin of the most indurated and reddest area and another on the sternal side close to the middle line

A portion of the pectoral muscle and fascia was also removed through the first incision

These portions were subjected to microscopic examination and this is what was found

The two sections showed frank cancer. It was, however, in both cases, of the most advanced scirrhous one ever saw—in fact it was nearly all fibrous tissue and there were only a few isolated groups of cancer cells

Both sections corresponded pretty much, but, if anything, the fibrosis was more marked in the older part of the cancer as one would expect

What had really happened was that the excessive growth of fibrous tissue had fairly crushed the cancer out of existence, it had come out on top in the struggle which the host is always making against the inroad of the parasite growth

The pectoral muscle and fascia were also quite free of cancer cells. Now atrophic cancer is not so very rare, not rare enough to warrant half a column about it in the I M G., but what sort of patients are generally the subjects?

They are nearly always old, shriveled and in their physical senility if not as one counts by years

In broad terms the younger and more "juicy" the patient the quicker grows the cancer, and a cancer in the breast of a young nursing woman is a matter of months rather than years

This evidently was one of those cases often spoken of but too rarely seen—spontaneous cure of cancer in a young patient

The inarticulate tissues of this woman had solved the great question—the question that everyone wishes to answer but that is scarcely nearer solution now than ever it was

It is easy to let one's imagination run riot in considering this case, one might ask are her tissues possessed of active immunity? are immune bodies present in the blood stream? would her blood plasma injected around the edge of a growing cancer have any effect in controlling its advance?

These are only some of the questions which are easy to ask and difficult to answer, but doubtless the woman's blood contains the secret if only it could be made to reveal it

Col Quicke decided not to interfere in the process of cure in which the tissues were so successfully engaged, but to leave well alone

The next case was one interesting clinically but unsatisfactory, as it was not correct to its logical conclusion, namely, operation and microscopical examination

A woman aged about 28 complained of a lump on the chest wall

It was exceedingly painful and had been quickly getting larger for the last few months

The woman confessed to having had a chance during the last few months and she came in with marked mercurial salivation

A lump the size of a tangerine orange occupied the position of the sternal end of the Right Clavicle, projecting forwards on to the chest

There was a smaller lump nearly at the acromial end of the same clavicle, quite separate from the first named but of similar physical characters

They were both acutely tender and palpation was carried on under difficulties. The large growth was slightly reddened and firm if not actually hard

There was a sense of crepitus and it was possible that the clavicle had undergone spontaneous fracture. There was no egg shell crackling

The patient was not markedly wasted and showed no signs of tertiary syphilis

The patient was removed by her relations the night before she was to have been operated upon and so the diagnosis must remain doubtful

The two most likely conditions were sarcoma or gumma, but there are strong points against both

Sarcomata are rarely painful and scarcely ever multiple and for a quickly growing tumour this was unusually firm

On the other hand, gummata rarely appear as soon as six months after the first appearance of a primary sore, and if a gumma, this should have shown some sign of yielding to iodide even in a week which was the length of time for which they had been exhibited

Spontaneous fractures in bones are generally due to secondary deposits of cancer and not due to sarcomata

It is always a good thing to carefully examine the breast and the rectum of a person who gets a spontaneous fracture

The first sign of a secondary deposit in bone (which is a common site for metastasis in breast cancer) is a dull pain in the bone generally mistaken for rheumatism

Looked at any way, the case was a puzzling one and puzzling it must remain

The next case is only interesting as giving a peg on which to hang a few remarks about myeloid sarcomata

The patient was a young girl the upper end of whose tibia was expanded to a great size. There were large veins coursing over the tumour which was smooth, firm and globular in shape. There was a thin shell of bone overlying it which yielded to pressure just as a celluloid ball does. It was diagnosed as an endosteal sarcoma which it turned out to be

Amputation was advised, but the patient refused, so Col Quicke opened up the swelling and scraped out all the new growth down to the very thin shell of bone which never seemed likely to become strong enough to bear the weight of the body

The cavity was re-examined a few weeks afterwards and it was found that the bone had thickened to a very great extent and that practically

all the morbid growth had been disposed of, for there was only a dense cavity of bone which had to slowly fill in

This case teaches us what power of recuperation bone possesses, especially in young people and incidentally how much more benign myeloid sarcomata are than any of the other varieties of sarcoma

Many pathologists noted and some surgeons agree with them, that these myeloid tumours should be taken from their unpleasant associates and be classed by themselves as simple tumours of the bone marrow or myelomata

It is time they are mesoblastic in origin just as it is true they occasionally exhibit real malignancy, but generally they may be removed without fear of recurrence, and even simple scraping is generally followed by a complete cure, and as far as I know they never form metastases

It is evident that if they are always derived from bone marrow they must be always endosteal, but some epulides or myeloid tumours of the joints are said to be periosteal not endosteal. If this is really so the discrepancy is difficult to explain

This brings us to the last case which in some ways is the most interesting of all.

The patient is a European and some six months ago he cut the ball of his foot with a sharp blade of grass. The small wound healed up in a few days and left no sign. A few months afterwards a small swelling appeared over the site of the now invisible wound. The patient opened it with a knife and let out a small quantity of opaque fluid.

The wound did not heal but slowly spread, and it was in this state when Colonel Quicke saw him.

The edges of the small wound were undermined and firm though not hard, and a small quantity of opaque fluid could be pressed out. The base at the wound was dense black due, as was thought, to the application of some black jungle medicine applied before coming to Bombay.

The dorsum of the foot was puffy.

The whole site of the disease was excised and sent for examination more on the supposition of its being Madura foot than on other grounds.

The skin on section shewed a condition highly suspicious of epithelioma but, and this is where the interest lies, this malignant change appeared to begin in the pigment bearing layer of the skin and the epithelial cells in the over-growth and the cell nests themselves contained a lot of black pigment.

Whether the black lotion applied had become so inflamed as to give the appearance of melanoma or whether the disease was that almost unknown condition of melano-carcinoma is uncertain, but section, have been sent to a famous pathologist in London for decision. Melanomata are almost invariably of meso-blastic origin and are therefore

classed with the sarcomata. It has been shewn that although melanotic sarcoma begins in the pigment layer of the rete mucosum or in the pigmented structure in the eye, yet they really start in the chromatophores in the skin and not in the epithelial cells.

One can recall the pigment cells of the frog's skin which throw out processes and darken the whole skin of the frog when he is exposed to light and contract again into dots and masses when the frog returns to the dark. So it is in the human skin the chromatophores which belong to the true skin, ramify between the lowermost cells of the rete mucosum and form the pigment layer so obvious in sections of the skins of natives of India.

These chromatophores serve as an origin for melanotic sarcomata.

There is a pigmented glandular epithelial cell in the cilary body and these according to Treacher Collins are rarely the site of true melanotic cancers.

In the skin of the patient under discussion the pigment was normally almost invisible, but suddenly this layer started into prominence and for a few millimetres the layer was hypertrophical and jet black and then the edge took an epitheliomatous character and nearly all the cancer cells contained granules of black pigment.

It is difficult to avoid regarding such a tumour as a melanotic cancer, and, if it be so, it is a pathological curiosity.

There were other cases in Colonel Quicke's wards from which much could be learnt but these few notes have already reached an inordinate length.

F P MACKIE.

ANNUAL REPORTS

THE BOMBAY HOSPITAL & DISPENSARIES REPORT FOR 1906

THIS report, dated 11th June, only reached our table in November. In a report on the Medical Institutions of a great Presidency which is limited to three pages, it cannot be expected that there is much of general interest, as it is impossible to report in any satisfactory way on the working of 675 hospitals in three meagre pages. Such a report can be only a bare comment on the tables of statistics.

The following extracts show that the bad fever season of 1906 in the Punjab was equally bad in Sind —

"The admissions from small pox fell from 2,362 in 1905 to 693 in 1906, but 3,545 cases of cholera were treated as compared with 303 in 1905. Regarding the increase, institutions in the Konkan accounted for 1,031, those in the Deccan 2,042, Gujarat 48 and Sind 121 admissions. Dysentery contributed 40,023 cases as compared with 32,917 in 1905. There was an increase of 61,652 cases of malarial fevers during the year under review, the returns from the Sind Institutions accounting for no less than 44,446, Konkan 7,505, Deccan 5,453 and Gujarat 4,727, the reasons given by the Civil Surgeons of Hyderabad and Sukkur, which Districts furnished the largest number, being 'that the River Indus was very high during the inundation season, and the water supply available was in excess of the requirements. Much of the country was flooded. As a result, mosquitoes have swarmed everywhere and but little could be done to reduce their numbers. More over there has been no real cold weather to kill the mosquitoes. On all sides it is said that this has been the worst fever season, known for very many years.' The ratio per cent of these fevers to the total treated was 20·6 against 19·2 in 1905."

On the surgical operations done Surgeon Genl J P Gicany writes as follows —

"The total number of surgical operations was 82,322, as compared with 82,113 in 1905. The patients operated on numbered 81,237, of whom 59,057 were cured, 956 relieved, 620 discharged otherwise, and 552 died, leaving 400 under treatment at the close of the year. Among the principal surgical operations, there were 700 amputations with 28 deaths as compared with 831 amputations and 53 deaths in 1905. The operations for cataract rose from 947 in 1905 to 1,238 in 1906. Laparotomy was resorted to in 59 cases, of which 20 ended fatally, against 72 cases and 33 deaths in 1905. In 140 cases the liver was incised for abscesses with 30 deaths as compared with 303 cases and 80 deaths in the previous year. The operations for hernia numbered 135 with 13 deaths against 126 cases and 14 deaths in 1905. Whilst lithotomies increased from 983 in 1905 to 1,170 in 1906, lithotomies and lithotrities showed a decrease of 111 and 22 over the previous year, and of the total, 60 ended fatally as compared with 56 in 1905."

The Surgeon General sums up in the following remarks which shows the satisfactory progress that is being made in the Presidency —

"During the year under review, the work of bringing the hospitals, especially those in the mofussil, up to the modern standard of requirements has steadily been maintained, and before long it is expected all will be provided with the necessary equipment to enable Civil Surgeons to undertake operations heretofore not performed, and with the result of affording more efficient relief to those requiring surgical treatment."

"Amongst the important buildings finished and under construction are the New Women's Hospital (St George's), New wing Cawasji Jehangir Ophthalmic Hospital, The Sir William Moore Operating Theatre J J Hospital Bombay and New European Hospital in connection with the David Sassoon Hospital, Poona, also new Hospitals are in course of completion at Karachi, Ahmedabad, Belgaum and Alibag."

"Three hospitals, viz, St George's, and the Geculdas Tejpal in Bombay and the Civil Hospital, Karachi, have been provided with valuable sets of X Ray apparatus, and the scheme for the training of medical officers and subordinates in the use of the X Ray apparatus has afforded increased facilities for diagnostic purposes. As funds permit, it is hoped, similar sets of apparatus will be supplied to other important institutions in up country stations."

Since the issue of the Annual Report of last year, Government have accorded sanction to the scheme for a Central Nursing Service for the whole Presidency, including Sind and Aden, this is in course of formation and rules are being drawn up by a Sub Committee. When fully established, the Association will supervise the training and supply of nurses on certain conditions to up country hospitals on the condition that local public bodies and the public generally defray half the cost of the maintenance of the number required and supplied."

THE BOMBAY HEALTH OFFICER'S PLAGUE REPORT

The Executive Health Officer, Bombay, Dr J A Turner, has published a very interesting report on plague in Bombay. In this is traced the history of the disease from the first notice of it in August 1896 in Bombay. He inclines to the most probable theory that the disease came to Bombay from Hongkong. It is hardly necessary to follow Dr Turner in tracing the history of the disease. The following table shows only too clearly the ravages of the disease —

YEAR	Total mortality in Bombay	Plague deaths in Bombay	Plague deaths in India
1896	33,451	1,936	2,219
1897	47,896	11,003	53,816
1898	51,961	18,185	116,285
1899	56,434	15,796	139,009
1900	79,350	13,285	92,807
1901	59,495	18,736	283,788
1902	48,414	13,820	583,937
1903	50,513	20,788	865,628
1904	42,676	13,538	1,143,993
1905	47,762	14,192	1,069,140
1906	52,871	10,823	332,181
1907 up to 31st March	11,790	3,169	379,705

Dr Turner's report is well illustrated by plans and maps of infected localities. A large portion of the report is devoted to figure showing the value of "pesterine." We quote the following paragraphs —

The best time for using pesterine, so that it may prove to be of the greatest value, would appear to be just when rats begin to die, for this is the time when fleas commence to leave the bodies of the dead rats and go in search of fresh blood which is generally available among the surrounding human beings.

"To do this efficiently, however, it is most essential in the first place that the Health Department should receive active co-operation and help from the people and that the intimation of dead rats should be sent as early as possible. It is very seldom, however, that people will come forward and give this information to the Health Department staff. If dead rats are found, they are very seldom handed over to a Municipal bigari, and although the public have been repeatedly informed, by means of lectures, notices, and pamphlets, what they should do under the circumstances, the dead rats are thrown out in the adjoining gully or the nearest dust bin cart, whence they are often carried away by crows or kites before the Municipal bigaries can get at them, some of the residents, who are nervous when they find dead rats quietly shut up their houses and go away to reside elsewhere, while others pay no attention whatever to dead rats, they do nothing and continue to reside in the same house. In this way, an important piece of evidence, which would have helped to check the spread of the infection to human beings, is lost, and the infected fleas remain free to help to spread the disease. When a plague rat is found in a gully and enquiries are made at the adjoining house with a view to ascertain where the rat came from, the residents generally at first deny all knowledge of rat mortality, and it is only after a few days when plague makes its appearance in such houses in an epidemic form that the residents acknowledge previous history of dead rats. It is then too late for disinfection, the fleas have already done all the harm they can and have moved on elsewhere."

"For years the people of Bombay have been asked to assist. The Health Department has published and distributed leaflets in all languages on the various customs and prejudices affecting public health, and instructed the people how to act. The Sanitary Association distributes pamphlets and gives lectures and provides health visitors. The Corporation provides the necessary authority and means to enable the Health Department to sweep and clean, by poison and traps, disinfect and lime wash. The Improvement Trust will in time render many parts of the city more sanitary and provide houses, but it is to the people we have to look for immediate assistance in controlling plague. Now they know and can see for themselves what should be done. It is not too much to ask them to assist us in our fight against plague."

"With the knowledge now available of the channels by which plague is spread, it must surely be possible by judicious administration to find some means for reducing the rat population, and thus relieving the suffering of the people of India without increasing ill feeling, resistance or friction of the community if properly carried out."

"The extermination or reduction of rats, previous to the anticipated outbreak of plague and the cleaning and disinfection of the haunts of the rats and houses with pesterine, is a practical measure, founded on scientific lines placed at our disposal by the most recent investigations."

By all means continue our scientific investigations, but in the meantime use the knowledge we have and try to overcome the difficulties in the way."

Correspondence

THE TRAINING OF HOSPITAL DRESSERS

To the Editor of "THE INDIAN MEDICAL GAZETTE"

Sir,—Please publish enclosed letter No 1267

Yours, &c,
H GIDNEY

From—CAPTAIN H GIDNEY, F R C S E, I M S,

Civil Surgeon, Goalpara,

To—THE INSPECTOR GENERAL OF CIVIL HOSPITALS,

Eastern Bengal and Assam

Dated Dhubri, the 31st October 1907

SIR,—I have the honour to address you on the following subject, and if it meets with your approval to request that you will be kind enough to obtain the opinion of the Local Government with a view to giving the scheme a trial —

The subject is regarding a class of servants called—"Dressers," who are employed in Mofussil Head Quarter hospitals and in District dispensaries. These men, as you are aware, are recruited from a very common class, uneducated in most

instances, and who, on first appointment, are absolutely ignorant of the duties expected from them. They are generally brothers, or some such relatives, of the compounder, panivallab and other mental servants of the dispensary, and possess no qualifications whatever to be enlisted as "Dressers." Year by year they acquire a superficial knowledge of antiseptics and asepsis from hints,—given now and then, to them by either the Civil Surgeon, Assistant Surgeon or Hospital Assistant, but this knowledge is learnt at the expense of the Surgeon's reputation, and the loss of a good many surgical cases. The zenith of their ambition and knowledge after years of service (with a very few exceptions) is how to prepare patients, for a few of the ordinary operations, and to dress (according to their own views) such cases as ulcers, abscesses, sinuses syringing out the ear, urethra &c. I would point out that the duties of a Dresser in most Head Quarter Mofussil hospitals are—

- (a) To dress surgical cases both in door and out door
- (b) To prepare patients for operations
- (c) To sterilise the instruments and dressings

In other words, he is a sort of a superintendent of the operation room, and looks after the care of all the surgical instruments, appliances and accessories.

The Assistant Surgeon is, as a rule, too hard worked an officer to be able to devote his entire attention to these details. In fact, his chief object is to see that his out-door attendance is up to the mark. It will thus be observed that the duties of a "Dresser" are of very great importance, and call for skilled labour on the part of the one so employed, for he must be an educated man, possessing more than a superficial insight of antiseptics and the preparation and preservation of all the instruments entrusted to his charge. In fact, he is of equal importance to the surgeon as the dispenser of drugs is to the physician. In other words, the dresser should be a thoroughly trained, up to date man, properly qualified to execute his responsible duties, the same as a qualified compounder. With our increasing knowledge and appreciation of the many diverse paths of infection, it will be obvious that too great importance cannot be placed on the necessity of equal thoroughness in each and every detail of surgery. It is an accepted fact that our present day operative technique is built up from a foundation and ground work of a multitude of details, each of which is of vital importance on account of its essential relation to any complete scheme of defence against bacterial invasion. If the surgeon, or his staff, on whom he is compelled to rely neglects one link in this chain or defensive asepsis, the result is that it is invariably weakened, and is often nullified. The surgeon who is not thus protected by the services of a properly trained dresser—even though his knowledge, skill and manual dexterity be of the highest order—must of necessity fail in that most important of all surgical attributes of successful surgery, viz., "consistency." It is this difficulty which I experienced in my mofussil surgical work, 30 or 40 cases would go well, then three or four bad results which appeared to be quite unaccountable. Inconsistency in surgical results is what I am sure all Mofussil Civil Surgeons experience, and I believe I am quite correct in attributing these failures to the incompleteness of the chain of defensive asepsis, or to speak more plainly, to the ignorance of the dresser, and his inattention to details in the preparation of the case, and the thorough scientific sterilisation of the instruments and accessories, etc.

The fact that surprisingly good results often follow lax methods, or that bad results are not unknown. Even in the presence of the most careful aseptic procedures cannot be brought forward as an argument for less vigorous attention to the details of operative technique, for there will always be unaccountable factors presented by each patient which will modify the final, as well as the immediate, result of an operation no matter how carelessly or carefully sought. That their absence, as well as that of many other unforeseen and indeterminable circumstances, cannot be demonstrated, leaves no alternative, therefore, for the surgeon, but, to anticipate their possible presence, and to meet their possible dangers by all the defensive measures that he can summon, and by this I mean a most scrupulous and thorough attention to every aseptic detail. These facts apply with such unusual force and weight to the duties carried out by the "dresser" i.e. attention to ligatures, sutures, instruments, dressings, lotions, their selection, preparation and sterilisation, etc., that to me it appears quite incomprehensible how these duties are to be carried out by the class of dressers now employed by most of the Mofussil hospitals. With this enormous responsibility attached to dressers I am sure you will agree with me that the present class of men are totally unfit for their appointments, and that the necessity of supplying trained men is not only more than necessary but urgently called for.

With your permission I beg to submit the following scheme for your perusal and approval—

- 1 The candidate must possess a fair knowledge of English
- 2 He must be below 25 years of age

3 He must be physically fit (especially free from any skin disease)

4 He should undergo a six months' training in one of the Medical schools, i.e., "Dacca" or "Dibrugarh" during which time he should be granted a "maintenance allowance" of from Rs 6 to Rs 8 per mensem. After this probationary period, he should pass a searching examination, to be conducted by one of the teachers of the Medical schools, and if found fit, he should be made to sign a bond, agreeing to serve as a dresser in one of the Government hospitals, for a period of three years at least, on a fixed salary.

5 If the above is not feasible I would suggest that the candidate be made to pass a searching examination in antiseptics and their preparation, sterilization of instruments and dressings, selection of instruments for various operations, and a thorough knowledge of splints and bandages. This examination could be conducted by Civil Surgeons. Such candidates need not give a bond to serve Government for any fixed period.

6 Salary.—Start on Rs 10 per mensem, with annual increment of Re 1 up to Rs 20 per mensem.

7 That no candidate be employed as a dresser until he can produce a certificate of efficiency, signed either by the Superintendent of a medical school or a Civil Surgeon. This rule to be most strictly adhered to and all Civil Surgeons be ordered accordingly.

In conclusion, I would remark that if all Head Quarter hospitals and Mofussil dispensaries were provided with dressers possessing the qualifications enumerated above, I have no hesitation whatever in stating that the surgical records would very much improve, and that there would be more consistency in the results of surgical operations.

I have the honour to be,

Sir,

Your most obedient servant,

H. GIDNEY, F.R.C.S.,

Captain, I.M.S.,

Civil Surgeon, Goalpara

A CASE OF CALCAREOUS DEGENERATION OF THE TUNICA VAGINALIS

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—On the morning of the 11th November 1907, I was asked to see a scrotal ulcer. On the parts being exposed I noticed in the centre of the ulcer what appeared to be a piece of bone. On closer examination I discovered that the tunica vaginalis on the left side had undergone a calcareous degeneration, and appeared and felt like a broken egg shell, the size and shape of a hen egg, and not much thicker. I decided at once to make a longitudinal incision, above and below the ulcer, to give me room to remove the shell. This was done easily enough, but in taking out the shell, it broke into several pieces.

The history of the case is a simple one. The patient, Dinmodar Chowdhury, had a small hydrocele on the left side. Inflammation set in about four months ago, and after some poulticing and fomentations, the village leech of Kokutia village, in thana Dibrugarh, of this district, decided to open what he diagnosed as an abscess. Pus came away freely, and the patient states he had relief. Since then all kinds of treatment had been adopted for the healing of the ulcer, but without effect, and as a matter of last resource the patient was advised to consult me.

The ulcer is now a small granulating surface, and cicatrization well advanced.

Yours, etc.,

J. G. S. FLEMING

Civil Surgeon, Burbhum

Service Notes

WE have received and herewith publish the following—

CAPTAIN DREDGE, I.M.S.

Through an accident at Glastonbury on the 8th October, the Indian Medical Service lost one of its most promising young officers in the person of Captain James Allen Dredge, and at the early age of 34 years.

He came home on furlough three months ago, and on the afternoon of the accident, was about to mount a young hunter, when the animal broke away, throwing him and fracturing his skull. The end came in a few hours, but he was quite conscious for some time after the accident.

Captain Dredge was the eldest son of Mr James Dredge, of Melrose, Glastonbury, and spent his school days at Blundell's

Tiverton He studied medicine at St Bartholomew's Hospital, when, after passing his examinations he remained some time as Resident Surgeon. Thence he proceeded to Netley and finally to India in the Indian Medical Service in 1897.

After a varied experience from service in Bangalore, Edwinstown in the Punjab, China (medal) Belgaum and Trichinopoly, he was finally posted to Bangalore as Staff Surgeon. He then looked quite a boy, but a very short acquaintance proved that he was already a man of wide experience, and imbued with a zeal which augured well for his future.

Without an experience of them it is difficult for any one to realize the mental and physical strain which a Staff Surgeon's duties involve in a large cantonment and sanatorium like Bangalore. But as far as it was possible for any man, single handed, to carry them out, the work was done in the most efficient manner by Captain Dredge. All his patients alike, from the General Officer Commanding to the humblest official received his best in time and attention. This cheerful earnest man was always "on duty."

But withal he was a good rider and a good shot, and found time for various field games. Nor did he allow the usual official discouragement to undertake it, to disgust him with private practice. On the contrary he undertook such practice and gave great promise of success in it. Indeed Captain Dredge will be as much missed by his private as by his official patients. But what shall we say of the loss which has with such appalling suddenness befallen his young wife and their three infant sons. Of one thing at least Mrs Dredge may rest assured, and that is, that this great grief is not entirely her own but is shared by a very large circle of sympathising friends.

"AN OLD ACQUAINTANCE"

THE following correspondence is republished for information —

No 915, dated Simla, the 15th August 1907

From—J C Fergusson, Esq., Under Secretary to the Government of India, Home Department,

To—The Secretary to the Government of Bengal, Municipal (Medical) Department

In continuation of the Home Department letter No 757, dated the 26th July 1907, I am directed to forward for information, a copy of the following letter to the Director General, Indian Medical Service, conveying the decision of the Government of India that, although an officer of the Indian Medical Service officiating in civil employ cannot count a period of study leave as part of the three years necessary for his confirmation in the Civil Department, he will be struck off the strength of his corps after three years' absence from it.

No 391G, dated Simla, the 24th July 1907

From—Major G A Robertson, Deputy Secretary to the Government of India, Department of Military Supply,

To—The Director General, Indian Medical Service

I am directed to forward herewith a copy of the correspondence marginally noted relative to the grant of study leave to an officer of the Indian Medical Service officiating in civil employ, and to observe that, although the period of such leave will not be counted as part of the three years necessary for confirmation in civil employ, the officer concerned will nevertheless as heretofore be struck off the strength of his corps after three years' absence from it under the provisions of Army Regulations, India, Volume VI, Appendix I, Condition 21.

FURLOUGH AND LEAVE—OFFICERS—With reference to India Army Order No 346 of 1907, it is notified that in future all orders granting leave on medical certificate to officers to proceed out of India should be worded in the following manner —

"The undermentioned officers are granted leave to proceed out of India on medical certificate under the leave rules of , the leave to have effect in India from the date of being struck off duty till the date of sailing, the specified period to count from the date of leaving India."

THE following letter, addressed to the *Irish Independent*, may be of interest to our Irish readers —

SIX BROTHERS DOCTORS

SIR,—It would appear from your issue of yesterday that the Earl of Kilmorey, when distributing the prizes at the opening of the medical school at Charing Cross Hospital, felt surprised at learning that there are at present five brothers doctors. I dare say his lordship will be more surprised to hear that the late Dr Macnamara had the pleasure of living to see six of his sons doctors, all making their mark.—Dr G M Macnamara, who represents his father, Colonel John Macnamara, I M S, Colonel William Macnamara, I M S ;

Major M Macnamara, I M S, Lieutenant Colonel Robert Macnamara, I M S, who was appointed lately Inspector General of Prisons, Madras and though last, not least, Dr Joseph Macnamara, who has a very extensive practice in London. They are a credit to their name and country — (*Medical Press and Circular*, October 16th)

WE are glad to see Lieutenant Colonel Pock, I M S, back in Calcutta in good health, after his very serious railway accident at the Sheringham Golf Links last August.

It is expected that there will be a couple of temporary promotions for administrative appointments for Colonels, I M S, during the coming hot weather.

MAJOR W D SUTHERLAND, I M S, is appointed to be Civil Surgeon, Jubbulpoor, during the absence on deputation (under para 10, Army Reg, India, Vol VI), of Lieutenant-Colonel W A Quayle, I M S.

LIEUTENANT COLONEL G W RODGERS, I M S, took charge of the civil medical duties, Kohat on 2nd October 1907.

LIEUTENANT COLONEL A SILCOCK, Civil Surgeon, C P, has been granted 6 months extension of furlough.

THE HON'BLE COLONEL N D MURRAY, I M S, has been nominated a Fellow of Allahabad University.

MAJOR P C PEREIRA, I M S, was to get one year's combined leave after 1st November 1907.

CAPTAIN W T FINLAYSON, I M S, joined the Madras Jail Department on 3rd September 1907, and was posted to the charge of the Central Jail at Salem.

LIEUTENANT COLONEL R NEIL CAMPBELL, Lieutenant Colonel T Grainger, and Lieutenant Colonel Quayle have been put on special duty to learn the office work of Principal Medical Officers.

THE *Lancet* for November 2nd, devoted a leading article of nearly three columns to the subject of the identification of blood stains, taking as its text, the admirable and useful book by Major W D Sutherland, M D, I M S, on blood stains (Baillière Tindall and Cox), which we notice in another column.

ON the recommendation of the Government of India, His Majesty's Government has been pleased to confer a good service pension on Surgeon General W R Blowne, M B, C I E. Surgeon General Blowne entered the I M S, as Surgeon on 1st April 1873, became Surgeon Lieutenant Colonel 10th August 1893, Colonel on 19th May 1903, and Surgeon-General with the Government of Madras dated 11th October 1905. On arrival at Madras in November 1873, he was attached to the General Hospital, he afterwards served with several requirements till in November 1880 he became Resident Medical Officer at the Madras General Hospital and Professor of Pathology. He was Medical Officer at Ooty from November 1884 till September 1888, he then held several times the acting Professorship of Surgery, and was appointed Professor on 12th June 1890, which post he held till April 1896 he acted as Principal of the Medical College and Professor of Medicine from 7th April 1896 till 5th November 1902. In November 1902 he became acting P M O, Madras, next he was promoted to officiate as Surgeon General with the Government of Madras on 29th March 1904, and on October 11th, 1904, he was confirmed in this post, which he still holds.

He served in the Rumpu Rebellion, 1879-80, and was made a C I E in January 1906.

He succeeds to the good service pension rendered vacant to death of Surgeon General Sir J Fyler, Bart., I M S.

WE regret to record the death in England of Captain G E Charles, M B, on 28th September 1907.

CAPTAIN F H STEWART, I M S, is appointed Surgeon Naturalist, Marine Survey of India, from 24th October 1907, vice Captain R E Lloyd, I M S, resigned.

CAPTAIN F D S FAYRERS, I M S, joined the Foreign Department permanently, on his return from furlough.

THE undermentioned officers resumed charge of their duties in connection with plague preventive measures in the United Provinces at the places and on the dates entered against their names —

Lieutenant N S Sodhi, I M S, Lucknow, 7th October 1907, and was subsequently posted to Cawnpur.

Captain H W Illius, I M S, Lucknow, 16th October 1907.

CAPTAIN H W ILLIUS, I M S, on plague duty, Lucknow, to hold charge of the current duties of Medical Officer of the Central Prison, Lucknow, in addition to his other duties, *vice* Major C B Prall, I M S

WITH reference to paragraph 1013, Army Regulations, India, Volume I, it is notified for information that the rewards admissible for passing in the Burmese language will be discontinued to Native Officers, Hospital Assistants, Non-commissioned Officers, and soldiers of Local Burma Battalions, with effect from 31st March 1908

THE Services of the undermentioned officers are placed temporarily at the disposal of the Government of the United Provinces for employment on plague duty, with effect from the dates noted against their names —

Captain H W Illius, I M S	15th October, 1907
Lieutenant W H Boalch I M S	14th October, 1907
Lieutenant C E Palmer, M B I M S	9th October, 1907
Lieutenant Narendra Singh Sodhi, I M S	7th October, 1907

CAPTAIN A K LAUDIE I M S, Assistant Plague Medical Officer, Gujranwala, was granted privilege leave for five weeks, under articles 250 and 260 of the Civil Service Regulations, with effect from the forenoon of the 12th September 1907. On return from the above leave he was appointed District Plague Medical Officer Gujranwala, and assumed charge of his duties there on the forenoon of the 16th October 1907, relieving Captain M S Irani, I M S

CAPTAIN G I DAVYS, I M S, Assistant Plague Medical Officer, Simla, was placed on special duty in the Amritsar district, with effect from the forenoon of the 17th October 1907

CAPTAIN M MACKELLVIE, I M S, made over charge of the Howrah Jail to Major J T Calvert, I M S, on the forenoon of the 8th October 1907

LIEUTENANT COLONEL T GRAINGER, I M S, made over charge of the Muzaffarpur Jail to Captain J Masson, I M S, on the afternoon of the 2nd October 1907

MAJOR A GWYTHYER, I M S, made over charge of the Outack Jail to Major E E Waters, I M S, on the forenoon of the 11th October 1907

MAJOR B H DEARE, I M S, made over charge of the Bankipore Jail to Major B C Oldham, I M S, on the afternoon of the 16th October 1907

SENIOR ASSISTANT SURGEON UMESH CHANDRA DAS made over charge of the Baiduan Jail to Captain H B Foster, I M S, on the afternoon of the 21st October 1907

MAJOR C J ROBERTSON MILNE M B, I M S, made over charge of the Behampore Jail to Lieutenant Colonel A H Nott, I M S on the forenoon of the 24th October 1907

ASSISTANT SURGEON KALI PROSARNA BANERJI made over charge of the Allah Jail to Major R H Maddox, I M S, on the forenoon of the 24th October 1907

MAJOR C B PRALL, I M S, Superintendent of Central Prison, Lucknow, has been granted one year's combined leave from 8th November

CAPTAIN D N ANDERSON, I M S, is posted a civil surgeon of Ohhindwara, C P, and Major N P Ramier, I M S, is placed on special duty in that district

ASSISTANT SURGEON K P MOOLLAN, L M AND S, has been placed on general duty, Bombay, with effect from the forenoon of the 25th October 1907

ASSISTANT SURGEON P P BALSARA, L M AND S, having returned from leave, assumed charge of the Prince of Wales' Dispensary, Aden, on the afternoon of the 10th October 1907

ASSISTANT SURGEON V D MERCHANT, L M AND S, has been appointed to the medical charge of the Sundaidas Mulji Dispensary, Jalgaon, with effect from the afternoon of the 23rd October 1907

ASSISTANT SURGEON G G BOPARDIKER, L M AND S, has been appointed to the medical charge of the Malegion Dispensary, with effect from the forenoon of the 27th October 1907

THE following transfers are ordered in the Medical Department —

MR T W MINTY, 1st class Military Assistant-Surgeon, is transferred from Pegu to the civil medical charge of the Chin Hills, Falam, in place of Captain G H Stewart, I M S, transferred

ON relief by Mr T W Minty, Captain G H Stewart, I M S, is transferred from Chin Hills, Falam, to the civil medical charge of the Pegu District, in place of Mr T W Minty, transferred

ON return from furlough Major C Duer, F R C S, is posted as Civil Surgeon of Maymyo, Burma

CAPTAIN F V O BEIT, I M S, a recently Civil Surgeon of Maymyo was granted one month's privilege leave

CAPTAIN J G G SWAN I M S, made over charge of Shahpur, Punjab, to Assistant Surgeon Ferose Din, from 5th August

ON return from leave Lieutenant-Colonel J Sykes, I M S, goes back to Bareilly as Civil Surgeon

LIEUTENANT COLONEL J K CLOSE, I M S, M D, is posted as Civil Surgeon of Naini Tal

LIEUTENANT COLONEL J GARVIE, I M S, has gone to Meerut as Civil Surgeon

LIEUTENANT COLONEL J J PRATT, I M S, on relief by Lieutenant-Colonel J Anderson, I M S, returns to Fyzabad as Civil Surgeon

MAJOR C MILNE, I M S, has gone to Gonda as Civil Surgeon

MAJOR W H ORR, I M S, is transferred from Gonda to Bahraich

LIEUTENANT J T PARKINSON, I S M D has been transferred from Fatehpur to Hardoi, U P

Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs Thacker, Spink & Co, Calcutta

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs Thacker, Spink & Co, Calcutta

Annual Subscriptions to "*The Indian Medical Gazette*," Rs 12 including postage, in India Rs 14, including postage, abroad

BOOKS, REPORTS, &c, RECEIVED —

Bombay Hospitals Report.
Bombay Health Officer's Report
Index of Treatment Hutchinson and Collis (Wright & Co Bristol).
Practical Medicine Series, General Medicine (Gillio & Co, Glasgow).
Cancer by Sherman Bigg (Baillière, Tindall and Cox)
Syphilis in the Army, by Major Bruce, R.A.M.C. (John Balo Sons and Danielson).
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Original Articles.

PRELIMINARY NOTE ON THE ETIOLOGY OF BLACKWATER FEVER

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LT COLONEL, I.N.S.,

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THE valuable note by Captain McCay, I.M.S., on Quinine Sulphate as a factor in the causation of hæmoglobinuria has induced me to publish my own views on the etiology of this dangerous condition (I purposely avoid calling it a "disease")

For many years I have held the opinion that the so called blackwater fever—at any rate, as we know it in India—is nothing more or less than quinine poisoning, but I have hitherto been unable to explain to my own satisfaction why it is, if this be the case, that blackwater fever, as far as India is concerned, is only met with in the Terai and Assam, and in a few isolated districts in the Madras and Bombay presidencies? Quinine, in large doses, is given to patients all over India, yet we never see it produce hæmoglobinuria except in certain well defined areas. If, therefore, quinine is the immediately exciting cause of the hæmolysis, there must be another factor at work which causes these remarkable clinical differences.

The usual view is that the second factor is malaria, and this is where I beg to differ.

Dr J W W Stephens, in his article on "Blackwater Fever" in the new edition of Allbutt's Medicine, gives it as his opinion that "it is malarial in nature, *i.e.*, it can only occur in those who are suffering from, or have quite recently become infected with, malaria, and that the onset of the disease is induced most commonly, though not invariably, by quinine," and he goes on to say that "the distribution of intense malaria and blackwater fever corresponds very closely." This statement is not in accord with my own experience, for I have seen much intense malaria both in the United Provinces and in Bengal, but in neither of these provinces have I ever seen a case of blackwater fever except in patients who have come from either Assam or the Terai.

Stephens says very clearly that there is no case on record of blackwater fever having attacked a person who has not previously, and most frequently only a short time previously, suffered from malaria. I admit that in every case of blackwater fever there is undoubtedly a history of malaria, but I would urge that, in face of the discovery of the Leishman-Donovan body, we have considerably to revise our notions of what is, and what is not, malaria, and I think it will ultimately be demonstrated that many of the cases which we now call malarial are

really early stages of cachexial fever, and I hold that the second, and hitherto undiscovered factor in the causation of blackwater fever is not the malarial parasite but the Leishman-Donovan body.

My reasons for this belief are as follows—

(a) Although the distribution of blackwater fever does not correspond with that of malaria, it does correspond very closely with that of the kala-azar or cachexial fever.

(b) Blackwater fever closely resembles in its symptomology the Texas fever or hæmoglobinuria of cattle, a disease which is due to the presence in the blood of a pyrosoma. This is a parasite which morphologically closely resembles the Leishman-Donovan body, but differs from it in the fact that it inhabits the red corpuscles, whereas the Leishman-Donovan bodies are, as a rule, found only within leucocytes and endothelial cells. The chief morphological difference between the two parasites is that the pyrosoma has apparently only one nucleus. According to Luke, however, a second chromatin body is always present, but is very minute, so that it has hitherto been overlooked and is usually situated near the pointed end of the body. If this observation be confirmed, the morphological differences between the two parasites practically disappear.

Donovan, moreover, who is supported by Laveran and Mesnil, holds that the Leishman-Donovan bodies do occasionally appear in the red corpuscles of the peripheral blood, and that when this occurs, they are remarkable for their small size and for having, like a true pyrosoma, a single chromatin mass.

An even stronger point of resemblance between the two parasites is that in the case of the pyrosoma, the intermediate invertebrate host is always some species of tick, and there are many reasons for believing that in the case of the Leishman-Donovan body the intermediate host is the common bed bug.

Here then we have two parasites, closely resembling one another morphologically, both probably conveyed by allied species of biting insects, and one of which is known to cause hæmoglobinuria. Why should not a similar condition be produced by the other?

And may not the differences in the symptoms in the two cases be due to the fact that in Texas fever there is a general blood infection, with extensive hæmolysis and consequently hæmoglobinuria, whilst in kala-azar the parasites are confined to the spleen, liver and bone-marrow, with the result that the blood destruction is more gradual and less extensive and never reveals itself by hæmoglobinuria except when its intensity is increased by some accidental cause such as the exhibition of quinine sulphate?

(c) Clinical experience teaches us that in kala-azar the blood is undoubtedly in an abnormally labile condition as shown by the tendency to mucous hæmorrhages and to the formation of extensive petechial blotching, especially of the

extremities There is also the undoubted fact that quinine, instead of doing good in this disease, is distinctly harmful.

(d) Christophers and Stephens have shown that, in a series of cases of blackwater fever, malarial parasites were only found in 12.5 per cent of cases, whereas there was an increase of large mononuclear leucocytes in 93.8 per cent of cases. This they regard as evidence in favour of the malarial nature of the disease, but I regret that I cannot agree with them on this point. On the contrary, it appears to me to be fairly strong evidence that the cases are of the nature of cachexial fever or kala azar, in which, as we now know, mononuclear increase is a marked feature and cannot therefore any longer be regarded as evidence of the malarial nature of an affection, it merely goes to prove, as Rogers has already pointed out, that the infection is of a protozoal as distinguished from one of a bacterial nature.

I am aware that there is a certain amount of evidence to the effect that by combining prophylactic doses of quinine with the efficient use of mosquito-curtains, groups of persons have apparently escaped blackwater fever, but I would urge here that this is no proof of the malarial nature of the disease, and I would point out that by the efficient use of mosquito-curtains, the patient is protected from biting insects other than the anophelids.

One ought to mention also that Stephens has tabulated 95 cases by competent observers, in 95.6 per cent of which malarial parasites were found in the blood on the day before the onset of the hæmoglobinuria, but I consider that in face of all the facts now before us, further observations are necessary before these results can be accepted, and I maintain that whereas a combination of cachexial fever and quinine poisoning can account satisfactorily for the peculiar local distribution of blackwater fever, a combination of malaria and quinine utterly fails to furnish a reasonable explanation of the phenomenon.

My view then is that blackwater fever only occurs in patients who are the victims of kala-azar. In those rare cases in which no quinine has been given, the hæmoglobinuria is due to the unaided action of the hæmolysins produced by the Leishman-Donovan body, but usually the attack is precipitated by the administration of sulphate of quinine to a patient who has been wrongly diagnosed to be suffering from malaria. Whether or no the ill-effects of the drug are due to the quinine itself or, as suggested by McCay, to the sulphuric acid it contains is a matter for further investigation.

A careful series of observations are being made, at my suggestion, by Captain McCay upon patients in the Medical College Hospital with a view to test the resisting power of the red corpuscles in the various stages of kala-azar as compared with those of malarial patients and normal individuals, and we hope to report on results later on.

Meanwhile if we are to wage a successful war against blackwater fever, the following rules require to be observed —

1. Wherever microscopical examination is possible, quinine should not be administered until after the demonstration of malarial parasites in the blood. This rule is strictly observed in the Medical College Hospital.

2. If no microscopical examination be possible, then quinine should be administered with great caution, and its use should be definitely abandoned if two or three moderate doses, *given in solution*, do not produce an appreciable effect upon the temperature.

3. In view of Captain McCay's observations, the hydrochlorate or acid hydrochlorate of quinine should always be used in preference to the sulphate.

HÆMOGLOBINURIA AND QUININE SULPHATE *

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If a salt solution is put in a vessel and pure water carefully poured on it, after the whole has been left entirely undisturbed for some time, it is found that the salt has distributed itself through the entire solution, the movement of the dissolved substance does not cease until uniform distribution has taken place throughout the solution. This phenomenon, *i.e.*, the movements of particles of a dissolved substance from places of higher concentration in the liquid to places of lower concentration, is called the diffusion of the substance. If we wish to render apparent the movement of the dissolved substance in the liquid, we can accomplish this by separating the place of higher concentration from that of lower concentration by a wall that will give passage to the liquid but not to the dissolved substance. Such a wall is termed semi-permeable.

The dissolved substance in its movement through the liquid will now be stopped by this wall, and in consequence will exert a pressure upon it and the membrane will be seen to bulge. This pressure is termed the osmotic pressure of the solution.

The two laws governing osmotic pressure are—

(i) At constant temperature the osmotic pressure of dilute solutions is proportional to the concentration of the dissolved substance (Boyle van't Hoff).

(ii) At the same osmotic pressure and the same temperature equal volumes of all dilute solutions contain the same number of molecules (Avogadro-van't Hoff).

* Being a paper read at the December Meeting of the Medical Section of the Asiatic Society of Bengal.

Applying these facts to the blood of man, the red blood corpuscles may be looked upon as small globules formed of an impermeable or semi-permeable membrane containing a certain percentage of salts and hæmoglobin floating in a fluid medium—the blood plasma—of the same density, *i.e.*, containing the same percentage of salt.

It may therefore be accepted that the red blood corpuscles and the plasma in which they float are in a condition of osmotic equilibrium, in fact, very careful experiments by Kiong and Fueth have shown this to be the case.

The same osmotic equilibrium has been shown to exist between all the various body fluids with the exception of the urine.

It is therefore evident that any modification of the osmotic pressure of the blood plasma will tend to upset the osmotic equilibrium that should normally exist between the red corpuscles and the plasma. Thus, a lowering of the osmotic pressure of the plasma without at the same time an equal lowering of the osmotic pressure of the red blood corpuscles will act as a disruptive force on the envelope of the erythrocytes and eventually cause them to burst open and extrude their hæmoglobin.

The osmotic pressure of a complex fluid such as the blood plasma depends, according to Avogadro-van't Hoff's law, on the number of molecules it contains.

From practical experience, however, it has been found that the large proteid and albumenoid molecules exert very little pressure and may therefore be neglected, so that osmotic pressure is in reality a measure of the number of inorganic molecules in solution. Any change in the number of inorganic molecules in solution in the blood plasma will mean a change in its osmotic tension, and as it has been found that the erythrocytes behave in the same manner as a semi-permeable membrane, a dilution of the plasma causing a diminution in the number of inorganic molecules and therefore a lowering of its osmotic pressure will result in the absorption of water by the red corpuscles, so that they swell up and, if the lowering be sufficient, eventually burst.

The reason of this is that after dilution of the plasma the contained salts and hæmoglobin of the erythrocytes tend to pass out into the diluted plasma, but are prevented from doing so by the impermeability of the envelope of the red blood corpuscle, on the other hand, water finds its way in by endosmosis until the osmotic tension inside the envelope becomes equal to that outside or, what is more probable, until the envelope is unable to bear the pressure and ruptures.

Hæmolysis with hæmoglobin, passing into solution in the blood plasma, may therefore be brought about by decreasing the number of inorganic molecules present in the plasma.

In the form of hæmoglobinuria known of as Blackwater fever there is undoubtedly a great and widespread breaking down of the red cells of the blood, it is therefore evident that any thing, the absorption of which is able to cause a decrease in the total number of inorganic molecules in solution in the plasma would, other things being equal, upset the normal osmotic equilibrium and increase the tendency to rupture of the erythrocytes, and perhaps to precipitate an attack of the disease.

Most observers accept malaria as the primary cause of Blackwater fever—the infection being probably repeatedly effected daily—so that many of the erythrocytes have already been broken up, many others injured by the presence of the malarial parasite, if now, due to any cause, the salt concentration of the plasma becomes seriously lowered, the effect will be to produce a difference in osmotic pressure between the erythrocytes and the fluid in which they float, so that the red cells—and particularly the innumerable injured corpuscles—are brought nearer and nearer the point at which hæmolysis takes place, according to the greater and greater diminution of the total salinity. That it is those corpuscles, injured by the presence of the malarial parasite, that do break up in Blackwater fever, would appear probable from the fact that once the attack is precipitated, no parasite can be found.

The precipitating effects of "quinine" in the causation of hæmolysis of the erythrocytes and hæmoglobinuria are so widely believed in by experienced observers as to appear worthy of general acceptance.

In order therefore to discover the effects of the administration of "quinine" on the total salts of the blood, a large number of individuals were examined before and after administration of the drug by the mouth. Before the investigation had proceeded very far, I was forced to the conclusion that the changes observed were due, not to the "quinine" but to the form of the salt given, and further experience showed that the modifications in the number of inorganic molecules of the plasma depended on the acid radicle—the acid part of the salt—and not on the alkaloid. Thus, sulphates in any form were found to cause a decrease in the total salt concentration of the serum, whether in the form of quinine sulphate, magnesium sulphate or dilute sulphuric acid.

The following table shows some examples of the modification of the serum caused by the administration of sulphates. In order to check the results, a chemical estimation of the percentage of chlorides of the blood serum was made before and after the drug was given, as will be seen, the results are in harmony with the changes observed in the salt concentration.

TABLE I

DATE	Case	Salt concentration of serum exposed in terms of Na Cl (before)	Drug and dose	Salt concentration of serum in terms of Na Cl (after)	Chlorides of serum before drug	Chlorides of serum after drug
		Per cent		Per cent	Per cent	Per cent
7th August 1907	1	1 07	Quin Sulph gr 5	965	753	724
9th August 1907	1	1 07	"	914	753	723
10th August 1907	1	1 07	"	865	753	705
12th August 1907	1	1 07	gr 10	701	753	612
13th August 1907	1	1 07	"	876	753	720
14th August 1907	1	1 07	"	1 016	753	758
23rd September 1907	2	1 168	Magnes Sulph gr 30	928	701	684
25th September 1907	2	1 168	"	812	701	679
26th September 1907	2	1 168	"	719	701	675
28th September 1907	2	1 168	"	1 04	701	695

In every instance in which a sulphate was given by the mouth a well-marked fall in the salt concentration of the serum was observed and the rapidity of the fall varied directly with the amount of sulphate ingested. As will be seen also in the two cases shown on the table after the initial fall—the negative phase—there was a gradual rise to the normal concentration again.

THE SIGNIFICANCE OF THIS DIMINUTION OF THE SALT CONCENTRATION PRODUCED BY SULPHATES

From the corroborative evidence of an accompanying fall in the chlorides of the serum and from results obtained by other methods of investigation, it may be accepted that the absorption of sulphates produces a diminution in the total number of inorganic molecules in the blood plasma and therefore causes a decrease in its osmotic pressure. In this way the osmotic equilibrium between the red blood corpuscles and the plasma is upset and the ultimate result will be to produce a disruptive force inside the erythrocytes.

This disruptive force will be the greater, the more the inorganic molecules of the plasma are diminished in number, and it will be the more effective in causing hæmolysis, the more the corpuscles are injured by the presence of the malarial parasite.

It might be argued from these facts that, given a malarial infection in which sufficient injury had been sustained by the erythrocytes, the administration of large doses of sulphates will suffice to precipitate an attack of hæmoglobinuria. That this explanation in itself is not sufficient is shown by practical experience—even the severest forms of malaria treated with heroic doses of quinine sulphate do not develop into hæmoglobinuria except in certain well-defined areas. Further, from results obtained by myself and other workers, it has been shown that the red blood corpuscles can withstand a dilution of the plasma until it becomes less than a 47 per cent solution before disruption takes place; and, in my

investigations on the action of sulphates, I have only once been able to reduce the salt concentration of the serum below a 70 per cent solution, it is therefore evident that, besides the injury done to the erythrocytes by the malarial parasites and, in addition to the disruptive force produced inside the red blood corpuscles by the administration of sulphates, another factor must be present—and this factor must be of such a nature as, by its presence, to lessen the resisting power of the envelope of the red blood cells. It is most probable that the substance alluded to is a hæmolysin, *i.e.*, a substance tending to cause solution of the red blood corpuscles. So far there is no direct evidence that such a substance exists in the blood during an attack of the type of hæmoglobinuria referred to, but by analogy it would appear exceedingly probable that such is the case, and its presence would explain all the facts. The observations made on a case of Blackwater fever recovering from a smart attack showed that the resisting power of the remaining erythrocytes to hæmolysis was immensely increased, this would certainly suggest the presence of something conferring great resisting power and, therefore, of the nature of an anti-hæmolysin.

SUMMARY OF THE CAUSATION OF THE ONSET OF BLACKWATER FEVER

(i) Most authorities agree that malaria is the primary cause and that by prevention of malaria Blackwater fever would become non-existent.

(ii) The great majority of clinical observers consider "Quinine" the actual exciting cause of an attack.

(iii) The probabilities are, and the evidence favours the conception, that a hæmolysin is generated which by its action lessens greatly the resisting power of the erythrocytes to hæmolysis, so that even a slight decrease in the osmotic tension of the plasma, compared with that of the red corpuscles, becomes an important factor in precipitating a breaking-up of the red cells of the blood.

This decrease in the osmotic tension of the plasma is directly brought about by the absorption of sulphates into the blood. The SO_4 on arriving into the blood plasma displaces weaker acids such as CO_2 , Cl , etc., and combines with them bases so that Na_2SO_4 and CaSO_4 are formed, these salts being foreign to the human system are, on arrival at the kidneys, eliminated, and thus the blood becomes poorer in alkalis and total salts. The same results follow the administration of potassium, alkaline carbonates and combinations of alkalis with vegetable acids. These facts of the truth of which there would not appear to be any doubt, will explain the action of "quinine" as a causative factor in hæmoglobinuria, for "quinine" means the sulphate of quinine in the great majority of the instances of its administration.

With regard to the hæmolytic factor or hæmolysin at present, practically nothing is known. How it is formed, the conditions necessary for its formation, why its formation in sufficient amount to become a serious danger

inorganic molecules in solution in the blood plasma and thus, perhaps, precipitate an attack of hæmoglobinuria, it therefore seemed possible by giving a salt that need not necessarily be eliminated at once, *i.e.*, one not absolutely foreign to the system—to be able to increase the total salts of the plasma and, in this way, lessen the tendency of the red blood corpuscles to hæmolysis. The common salts of the plasma are the chlorides, and it appeared probable that these salts would, on absorption, if not actually cause an increase, at least prevent a loss of the inorganic molecules already present. I began therefore a series of investigations on the effects of the administration of chlorides by the mouth. In view of the generally accepted malarial origin of Blackwater fever, and therefore of the urgent necessity of administering quinine to get rid of the malarial parasite from the blood, the forms of chlorides most necessary to know the action of are the compounds with quinine. The following table gives the results obtained in a few of the observations made—

TABLE II

Date	Case	Salt concentration of serum in terms of Na Cl (before)	Drug given	Salt concentration of serum in terms of Na Cl (after)	Chlorides of serum before drug	Chlorides of serum after drug
		Per cent		Per cent	Per cent	Per cent
16th August 1907	1	1.09	Quinine hydrochlor			
18th August 1907	1	1.09	" gr 25	1.09	712	723
19th August 1907	1	1.09	" " 20	1.09		732
20th August 1907	1	1.09	" " 20	1.09		719
			" " 20	1.17		745
21st August 1907	2	865	Quin hydrochlor			
23rd August 1907	2	865	" gr 10	1.04	73	
24th August 1907	2	865	" " 10	865		719
26th August 1907	2	865	" nil	865		
27th August 1907	2	865	" gr 30	1.392		877
21st November 1907	3	865	" " 30	1.856		718
			Quin hydrochlor	1.076	723	738
			gr 15, Sodn chlor			
			gr 90, ac hydro			
			chlor dil, mm 15			
23rd November 1907	3	865	"	1.157		
24th November 1907	3	865	"	1.43		964

to life is limited to malaria occurring in certain well-defined areas, etc., are questions which have so far received no answer. It is probable that the relative virulency of the malarial parasite under different climatic conditions may be found to explain the mystery.

For the present, it would appear probable, from the effects of sulphates on the salinity of the plasma, that the administration of quinine sulphate, even in small doses, may just make all the difference between a malarial fever of a special type and a malarial fever complicated with marked hæmolysis and hæmoglobinuria.

THE ACTION OF CHLORIDES ON THE SALT CONCENTRATION OF THE PLASMA—A RATIONAL INDICATION FOR THE PROPHYLAXIS AND TREATMENT OF BLACKWATER FEVER

As it was found possible by the administration of sulphates to decrease the total number of

These results are in striking contrast to those obtained from the administration of sulphates, and, from the method of the examination made use of, it was very obvious that the red blood corpuscles after administration of chlorides are more difficult to hæmolysed than normal corpuscles, whereas after sulphates they are more easily broken up.

That this increased resistance is in part at least due to an increase in the inorganic molecules of the plasma would appear probable from the accompanying increase in the percentage of chlorides present. The importance of the bearing of these results on the prophylaxis and treatment of Blackwater fever is obvious. With this knowledge of the action of sulphates and what the significance of that action really is, it would appear quite time that the treatment of malaria—in those districts where Blackwater fever is prevalent—with quinine sulphate should

cease and a fair trial be given to its substitute—quinine hydrochloride. If this were done, I think there is a reasonable hope that the number of cases of Blackwater fever following almost immediately on the ingestion of sulphates in some form—and this covers a large majority of the recorded cases—would soon show a rapid diminution and perhaps disappear altogether.

Of course, it cannot be too strongly emphasised that the prophylactic use of quinine in any form in those districts where malaria is prevalent is, so far as the opinions of experienced observers show, the great safeguard for the prevention of both malaria and Blackwater fever. In fact, it is held by those best qualified to express an opinion that Blackwater fever can be absolutely eradicated from a district by the ordinary prophylactic administration of quinine. What I have attempted to show in the above article is that, while it probably does not matter in the very least what particular salt of quinine is administered prophylactically, in those patients, on the other hand, who are saturated with malaria, and whose erythrocytes are already severely damaged, the administration of sulphates in whatever form is dangerous, and that therefore as quinine must be given in order to destroy the malarial parasites, the best form of administration is the hydrochloride in combination with sodium chloride.

PSYCHOLOGY, MEDICINE AND SO-CALLED CHRISTIAN SCIENCE

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CAPTAIN, I.M.S.

THE long discussions in the correspondence columns of the daily papers display the widespread interest shewn by the public in the so-called Christian Science, and it is an excellent thing, for the sooner people begin to ask themselves questions on these psychological problems, the more readily will they be able to understand scientific explanations of the same, and sweep away the many superstitious and ignorant teachings of Christian Scientists, Peculiar People, and other Sects.

In science one's arguments and searchings after the causation of things are processes of deductive reasoning, e.g., in chemistry, results are obtained by experiment, other experiments bearing on this are made, and thus the elusive 'why and wherefore' is gradually approached. The results of many experiments bearing on different substances under different physical conditions are grouped, and, from multitudinous results, a workable hypothesis called 'Chemical Theory' is formulated, of necessity this theory as to the causation of chemical phenomena is not stationary, but, as decades go by and new discoveries are made, it has to be pared and added to and altered until 'Chemical Theory' as set forth today is totally different from that of fifty years ago. Man cannot dig to the root of the matter and say finally 'this is the correct immutable chemical theory' he can only say 'in the light of our present knowledge this is the Chemical Theory which adequately explains all (or most) chemical phenomena'.

The inner workings of nature are God's secrets and man can never expect to reach these, he can only

approach them by deductive processes. This limit occurs in all sciences.

Sciences vary, some are advanced, some are in their infancy of the latter is the science of psychology, many psychic phenomena have been noted, and are being noted (as witness the London Psychological Society with its enormous records). The very nature of the subject makes it the most misleading of all sciences, for it deals with something that cannot be seen, cannot be grasped, cannot be dissected as can the brain and body, something which enters into our everyday life and our relations with ourselves and each other, something which enters into our mental relations with animals, a science whose ramifications are infinite, of which the phenomena are most diverse. It is most easy to record and tabulate all these diverse phenomena, but when we attempt to marshal them in order and find a scientific explanation, we are beset with the greatest difficulties. If in material sciences the greatest and cleverest men cannot agree but hold different views and give different causative explanations—material sciences which can be checked for the most part by tangible experiment—how much more difficult for a science which endeavours to get at the causative basis of such things as coincidences, superstitions, the influence of mind upon mind and of mind upon body, ghosts, hypnotism, mesmerism, trances, catalepsy, hysteria, madness, so-called Christian Science, the miracles of holy shrines, thought reading, mental telepathy, so-called animal magnetism, etc., all of which are different phases of psychic phenomena.

How can it be otherwise than almost impossible to dissect out the why and the wherefore in such a science where each individual phenomenon lends itself to so much sentimental nonsense accidentally or purposely introduced. An apt illustration of the difficulty would be the Eastern juggler who so surrounds each trick with by-play that it seems to be done by supernatural agency and completely bewilders the onlooker, so with each psychic phenomenon there is present, either purposely introduced or as uncontrollable accessories, thus by-play which hides the kernel of the phenomenon more completely than do the juggler's accessories. His trick, nay, there is as much difference between the two as between a work of nature and a work of art.

Compare chemistry with psychology in chemistry each material thing, whether wood, stone, flesh, metal, flower or vegetable, is shown to have its chemical character and chemical composition, and can be split up into the same chemical substances, although it may appear in many different guises, each conforms to chemical law as laid down in the hypothesis 'Chemical Theory'.

In psychology immaterial things, such as thoughts, suggestions, impulses, good, evil, anger, joy, sadness are dealt with, each has its expression in certain muscular movements, resulting in well recognised expressions of the face, such as smiles, tears, etc., or of the hand or tongue in speech, writing, gestures, etc. It is easy to see that many of these mind expressions arise as a result of the information passed to the brain by one or more of our senses, for example, our ears receiving bad news telegraph it along certain nerves to the telephone exchange—the brain—there the bad news is received and intelligently understood and messages are thence sent along the wires—the nerves—to this, that and the other portion of the body resulting in muscular movements, these cause tears, or a sad expression of the face, or a stifled cry, or clenched hands, or a quick pacing of the room. Cause and effect is here clearly apparent and exactly the same as when, in time of war, some urgent news are sent from the front (of senses) to the metropolis (of brain) by means of wires (of nerves) and are immediately switched on by other wires (of other nerves) to the four corners of the earth (of the body) producing varied results (of muscular movements).

But apart from these there is a large class of thoughts, impulses, suggestions, desires including all that is popularly referred to as 'conscience' which arise *de novo* in the brain these differ only from the above mentioned cases in that there is no apparent cause. Presumably there is a cause, but what is it? The science of psychology embraces this class and seeks to put these in their proper place along with other psychic phenomena, and to evolve a working hypothesis to explain all.

Every science has its theory of cause and effect to explain phenomena coming under its particular head psychology has also its workable theory. But whereas the material sciences are old and long studied and whereas process of time has gradually shifted their theories on to safer and safer ground, psychological science is still in its infancy, not for want of attention, for it has been studied from time immemorial by all nations, civilised and uncivilised. It is only in recent years, however, that a serious attempt has been made to get at the cause of the phenomena hitherto attention has been confined to gazing open mouthed at the phenomena and dismissing the cause as some inexplicable supernatural agency or to evolving some mystic weird hypothesis which will not stand logical tests and for which there is no proof whatsoever—except imaginary.

Of necessity, therefore, a theory to account for psychic phenomena must be very incomplete, and insufficient to provide a satisfactory explanation for all of them. Only time can move it off the sands on to rock. Still, any theory which provides a satisfactory logical explanation, borne out by fact and experiment, for even a part of the whole, is better than nothing. The *dual mind theory* is the only one which offers a sound, logical, scientific explanation.

This theory postulates that each human being has two minds, an objective mind and a subjective mind.

It is impossible to give more than a superficial glimpse at those in a short article, and only results for the most part will be touched upon.

There is no difficulty about the objective mind. It is our everyday consciousness. It is the sum total of what our senses teach us, and of the information obtained by deductive reasoning therefrom. The brain is the telephonic exchange and is constantly receiving messages from the eyes, ears, nose, mouth, hands, feet, skin, in the shape of sensations of sight, hearing, smell, taste, touch, and from other less recognised senses, such as the muscular sense (informing the brain in what position the body is placed) and the sensations from each internal organ (e.g., from the stomach after a good dinner).

A baby's brain is a clean slate, but, as each day passes and each year rolls by, the records on the slate, as conveyed by experience gained from these senses and deductive reasoning therefrom, become more and more complex. School increases still more the brain's knowledge, for is not the child hourly having the senses of sight and hearing exercised, and more important still, its reasoning faculties of deduction trained (and often to stimulate these, certain tactile portions of its anatomy flagellated)?

The brain is also taught to express its thoughts, etc., in reading, writing, singing, movements, etc.

But what is this hypothetical subjective mind?

We all know (and this opinion is held by one at least of our greatest living anatomists) that there is a *something* we mentally possess which anatomists and physiologists cannot demonstrate, as they can the objective mind—a something which initiates certain spontaneous thoughts as apart from thoughts suggested.

It is the home of our inner consciousness, our conscience, our soul, our instincts especially of reproduction and self preservation—music, religion, and the fine arts all belong to it. Genius and talents are its expression.

The subjective mind is also the storehouse of the perfect memory of all things which have happened to us since infancy, whereas only a portion of this is remembered by our objective mind. Any doubter may test the truth of this statement by going to a hypnotist, and, granted

certain essential conditions not easily obtainable by everybody, have much of his past life recounted to him, many details of which he will have forgotten, or, to put it another way, all the details of which are in his subjective mind, but only a few of which are in his objective mind.

The subjective mind is endowed with perfect powers of deduction and marvellous powers of intuition, and for the former purpose has at hand the mass of information gained by the objective mind from the earliest thinkable day of the individual.

The powers of the subjective mind are not at all times, and never completely, at the beck and call of the individual, on the contrary, he is unaware of them for the most part, though the poet speaks of the *muse* which inspires him or the orator of the *inner power* which moves him and the flow of language which comes unhesitatingly from him, the objective mind provides the thought or idea, while the subjective mind works it out to its logical conclusion.

All habitual actions are worked out by the subjective mind alone, without reference to the objective mind, hence we are continually finding ourselves doing things automatically, unconsciously, and without thought. The meaning of the term *subliminal consciousness* as applied to the subjective mind, is thus easily seen.

Watch an orator in the midst of his oration disturbed by some discordant note struck by one of his audience, or again a musical genius in the midst of his performance disturbed by the striking of a match or a jarring discord from his accompanist, or a long suffering student vainly trying to concentrate his thoughts (in other words to bring into action the deductive reasoning power of his subjective mind) on some deep treatise with a dance going on in the next room. Up to the moment the jar occurs the oration or the flow of music goes on smoothly, full of fire, full of soul the audience is breathless, eagerly catching every word, every note, but from that moment onward, although the words and phraseology in the one case and the notes and rhythm in the other, are still perfect, yet there is a missing that fire and soul which alone can hold an audience, the thread has been broken. The technique of the objective mind and not the genius of the subjective mind is now in evidence.

One must conform to certain essential conditions to allow freer play to the subjective mind than obtains in ordinary everyday consciousness, and this mental attitude, when gained, is called the *partial subjective state*.

It is by means of the subjective mind that often the same thought at the same moment springs into the minds of two people near and dear to each other regardless of the space separating them and the more *'en rapport'* they are, the more their subjective minds are in communication by a kind of wireless telegraphy, but it is only occasionally that such thoughts, though present, rise to the threshold of consciousness. Hence the influence that a husband and a wife each mutually exerts upon the other in process of time. It is a well known fact that a musician or a genius of any sort cannot on every occasion tap his genius, he has to be in the mood for it, and the dual mind theory's explanation of this is that certain essential conditions must be fulfilled for the freer use of one of the attributes of the subjective mind—the objective mind must, for the time being, be rendered as inert as possible, hence objective consciousness must be lowered and all objective surroundings, material or immaterial, must be in conformity therewith. There must be no jarring note, nothing to distract the attention, no ringing up of the telephonic exchange by messages from any of the senses.

Consider what this one attribute of the subjective mind—a perfect memory implies or may imply, glance at the picture offered by the possibility that at death the subjective mind is freed from its earthly body and objective consciousness and lives in some state of existence with the ever present knowledge of its past deeds of good and evil, but possibly lacking the power of atonement.

Consider again what an enormous field it provides for the use of palmists, phrenologists, spiritualists, physionomists, etc.

Each of us having the helm—the objective mind—in our hand can guide our craft—the subjective mind—in whatever direction we will, and the more we guide it in a particular direction, the more easily it follows in that direction hence we each of us have certain guiding principles in our life hence we each choose some walk in life in which we get more or less proficient and automatic hence we speak of some foolish fellow 'going on the downward track' hence we realise how difficult it is to break ourselves of a habit, and how we have to guard ourselves against developing an undesirable one being given an oft repeated lead, the subjective mind involuntarily turns our thoughts and consequently our actions that way.

This is the power God places in each of us and in such a way that we can use it for good or ill.

The subjective mind not only never forgets, it never sleeps during sleep our objective consciousness, with our senses in more or less degree, is asleep but the subjective entity never it remains ready, alert, waiting, but inactive if, however, just before the objective mind goes to sleep there is in it some all absorbing thought, this may overflow into the subjective mind's grasp and the latter weaves some dream round the main idea or again a sensation conveyed from the body to the brain (e.g., from an overloaded stomach), the reverse of well being, is received there, but the objective mind, which could from experience and deductive reasoning place the true interpretation on this sensation, is asleep the subjective mind, however, is waiting, ready for a suggestion, here is one and it weaves its own story round the central impression of discomfort or again the subjective mind may receive an impression or message from some other person's subjective mind producing a dream, which, checked later and found to have some foundation of fact, is wrongly classed as a 'coincidence'.

In this manner then are the subjective and objective minds correlated. The subjective mind has great powers of reasoning and logic, but it is the objective mind's province to check it and direct it into proper channels. This relation between subjective and objective minds varies in different individuals an extreme objective type of person, where the objective mind is too much 'en evidence' and the subjective mind stifled almost completely, is the hard headed man of business who lives solely to make money, who has not in his composition one spark of sentiment, who gives no thought to music or religion or the fine arts, who has no "finer feelings," and in whose family relations little love and no sentiment occurs.

The opposite extreme is a genius (e.g., a poet or an artist, a brilliant pianist, a violinist, painter or other), a man who only sees the beauties of nature and expresses them in his life, who has no soul for mundane things in him his objective existence is of little account, he lives in the clouds, and the trifling things which make up life and a careful sorting of which constitutes common sense is almost lacking in other phraseology his subjective mind is allowed almost full play and his objective mind occupies a much lower place in the balance of power.

Go a step further where the subjective is in control and not checked by the common sense of the objective mind, where it is allowed full play, where it grasps any idea haphazard and fools round it to the top of its bent and you have a lunatic every inmate of a madhouse is a type of this the relation between genius and madness is there shown, for in every madhouse one finds people who in some way or other are perfect geniuses but, apart from that subject, are incapable, helpless imbeciles.

Examples of the improper use of the powers of the subjective mind are cases where a man becomes a clever professional burglar and hides his crimes with the

utmost cunning, or lives a life of clever professional begging.

Perfect mental balance is one in which the objective mind, while holding control, is only just more powerful than the subjective mind where healthy, honourable thoughts hold their place and are given to the subjective mind to work out and bring to their logical conclusions in history only one man has had this perfectly balanced mind, and he is Christ. Of later men, perhaps Shakespeare comes next.

The subjective mind in geniuses, however, is so frequently given full play that it may easily overtop the objective mind in mental control and cause insanity a perusal of the biographies of many of our geniuses will show how nearly related are genius and madness.

The whole of psychic phenomena are mostly, and probably totally, results of the workings of the subjective mind.

One is only partially aware of its presence in each of us, and that only by the most careful observation.

It can, however, be experimentally demonstrated.

Go to a village fair, seek the mesmerist's side show, watch his performance, how he asks anyone in his audience to step up on his stage, how he mesmerises them, how he gives one subject a cradle to eat assuring him it is barley sugar, how the subject will implicitly believe the statement and proceed to eat it and smack his lips over it how the mesmerist will place another subject horizontal, head on the back of one chair and heels on another, and tell him that his body cannot be bent and how he will then proceed to sit on his chest and yet the subject remains perfectly stiff and unbent how another is told he is a dog and how he will act as such, proceeding on all fours and barking. I refer to *bond fide* cases and not voluntary mimicry, collusion or fraud of any sort.

How are these phenomena produced? By certain means called mesmerism the objective mind is, with all its knowledge and power of attributing the correct explanation to sensations, put in complete abeyance and the subjective mind which never sleeps is thus left in control of the brain most yet ready and waiting to receive a suggestion and to act upon it.

In what way does this condition differ from sleep?

In both the objective mind is asleep and the subjective mind left in control, but in the mesmeric state the subjective mind of the subject is *en rapport* with the subjective mind of the mesmerist and ready and willing to receive any suggestion from him, whereas in sleep it is not *en rapport* with anybody and will not take any suggestion any other person tries to give it the mesmerist places an article in the subject's hand and says it is barley sugar the subject's ears convey the message to the brain and the subjective mind receives it and believes it, there being no objective mind to check the statement the brain then acts in the usual manner switching on messages along certain nerves in conformity with the idea an example of this is where one gives a patient a hypodermic injection of a liquid assuring him it will produce such and such an effect the objective mind is certainly in full control of the brain, but it has no means of checking the statement that the liquid is, say, morphia, and previous experience, either personal or hearsay, shows that the effect of an injection of morphia is to cause sleep the only sensation of the operation is a prick and a little local pain and hence provides no means of checking the statement that it is morphia. The objective mind believes that a dose of morphia has been placed beneath the skin and the subjective mind receives this information and brings it to its logical conclusion, which is sleep.

Of course, if one gave an injection of, say, strychnine, in a poisonous dose, all the imagination of objective or subjective mind that it was morphia would be of no avail whatsoever and the result would be death.

The case of the rigid man shows how in the subjective state much more muscular power can be called forth by the much more powerful nervous

impulses switched on in the brain by the subjective mind than can be evoked by the objective mind in a crisis affecting a person's life the subjective mind immediately takes control of the brain, and hence at such times we find ourselves spontaneously and automatically doing just the best thing that could be done under the circumstances to preserve our life or the life of some other person close at hand which is in jeopardy all can recall instances of these occasions calling forth 'bravus' and power hitherto unsuspected in that individual and this is popularly called bravery of course every case of bravery does not come under this heading, but most do

Taking the third case, the subjective mind is given the main idea that the individual is a dog it draws on the information contained in the objective mind on the subject of dogs and their habits it then sends off messages to muscles *via* nerves in accordance with this, producing a bark and a progression on all fours

We see then that granted certain essential conditions of which the greatest is confidence and faith in the operator's powers on the part of the subject, and confidence and faith in his own powers on the part of the operator (remember Christ's saying "If ye have faith ye can do all things"), a peculiar state of the central nervous system can in any individual be produced whether the operator be himself or another

The appearance of the body during this state (subjective state, hypnotic state, mesmeric state) varies, with the depth of the state induced, from one of ordinary normal appearance in everyday consciousness to one of profound coma (trance) in this state the brain is under control of the subjective mind and ready to act on any suggestion given to it the recipient of the suggestion implicitly believes it and acts on it, though it is self-evident to the objective consciousness of any one that the suggestion is absurd and false both operator and subject are in this subjective state, the operator only partially so and the subject more so in any case they are *en rapport*, i.e., their subjective minds are in communication and the operator can by word of command make the subject do what he likes—within certain limits, the details of which cannot be gone into here with more experience (and such are *bona fide* mediums) he can by mental telepathy, or in other words by allowing his objective mind to gather from his own subjective mind the information laid bare to it by the subjective mind of the subject, find out not only the subject's past life but also other information there present, seeing that a person's subjective mind is in communication with that of his father, mother, wife, brothers, sisters and children to a greater or less degree

The means by which this subjective state is produced are manifold mesmerists do it by passes, others by gazing at crystal balls, others by tying certain ocular muscles, others by the laying on of hands, others by prayer, others by suggestion pure and simple, but, however produced, one essential preliminary factor on the part of operator and subject is faith no one who really believes it impossible or scoffs or jeers at it can ever be placed in this state when produced one result is always present, i.e., the amenability to suggestion and the powerful nervous impulses that may thus be directed by the subjective mind on its own body, as witness the extraordinary muscular strength called forth in a fit of mania or delirium-tremens or during the frenzy of war

The very nature of an Eastern's religion and the influence of this through many generations makes him a highly subjective person

It is not necessary to be in a trance or to be completely hypnotised to obtain effects, but in deep hypnosis the suggestion is very potent, whereas in the partial subjective state the suggestion has to be several times repeated on different occasions

This latter is the state depicted by an audience during a magnificent opera or an impressive religious service or a great orator's speech where one can hear the

proverbial pin drop and where the orator can against their better reason sway his listeners' feelings this way and that one can always tell when one has moved an audience by observing that for a few appreciable moments after the conclusion of the work there is profound silence and then suddenly the spell breaks and there is thunderous applause

It will be readily seen how potent a medical adjunct is this subjective state

There are many bodily ailments producing a real discomfort and illness and yet where careful dissection of the part, *e.g.*, in certain forms of severe headache—reveals nothing wrong what is a headache? It is a very certain knowledge, on the part of the unfortunate sufferer, of pain in the head how is this produced? Taking our simile of the telephone, the exchange—the brain—receives the message of pain referred to the head, the objective mind from deductive reasoning interprets the message as one of headache, from the signs and symptoms of other aches and pains which have been previously referred to it this may be initiated at the other end of the wire—the scalp—or may be due to something wrong with the course of the wires—the nerves—or may be a fault of the receiver itself—the brain—but wherever the fault be, the brain's interpretation is that it is being urgently and painfully rung up by the scalp In the particular form of headache we are discussing, examination shows that the scalp ends of the wires, the wires themselves and the receiver as well are all intact and yet there is this continual message of pain now apply this method of treatment, put the brain in control of the subjective mind, give it an oft repeated suggestion that there is no headache, and in time this suggestion will be a lasting one and the headache will disappear But supposing that the peripheral end of the wires or the wires themselves or the receiver is radically at fault from actual disease, then all the suggestion in the world cannot stop the messages constantly sent from the damaged scalp or from the damaged wire to the brain or from the brain itself, i.e., the receiver until nature or medical art has cured the faulty spot such treatment may alleviate the results of the disease, i.e., the pain, but has no curative power over the disease itself

In France and Germany, where the science of psychology is understood better, more carefully worked out and put to more practical use than in this country, there are many clinics conducted by most eminent medical men where this force is used for medical purposes

Sir Lauder Brunton describes in one of his medical works how in France he visited one of these clinics, how the doctor received his patients in a room round which they sat, how each in his turn took the central chair beside which stood the doctor, how the doctor produced the subjective state by suggestion, saying "you will now go to sleep, you are feeling drowsy, your eyelids are drooping, you are asleep," how the patient fell in with these suggestions and had all the appearance of sleep, how he then said "when you waken, you will have less headache," how he then clapped his hands and the patient awoke and departed, how he himself was satisfied from his own investigation that the man's headache was really improved by this treatment

Note first that the fact that the patient presented himself to the doctor for cure of his headache by suggestive treatment presupposes faith and an expectancy of cure Note again that these operations are conducted by a medical man whose training in medical science enables him to correctly diagnose the complaint and to judge whether it is a case suitable for this treatment or no note that the cases he picks are cases of disordered nerve function and that he would no more attempt to cure cases of infectious fever, cancer, a broken bone etc., by this means than he would copy the methods of savages and their medicine men or remove a mole on the arm by blistering the foot or restore sight (the loss of which was due to real disease) by

tattooing the chest or say that because a drug A cures a disease B, it will therefore cure diseases C D E of course, it may so happen that one drug will cure more than one disease, but it is no argument to postulate that because it cures one disease, therefore it will cure all were this the case, the study of medical science would be waste of time, for of what avail would be the laborious accumulation of knowledge of different diseases, their causes, signs and symptoms if one knew that one single method of treatment would cure them all.

This is what the purveyors of patent medicines and also the Christian Scientists say to gull an innocent public and to make their living—and often a very fat one at that—at their expense.

We are now in a position to take a critical survey of the theory and doctrines that Christian Scientists put forward and ask the world scientific and otherwise to accept.

I grant that they do in certain selected cases perform cures and relieve pain, but their cures only consist of the alleviation of symptoms and go no further towards curing actual disease—which, remember, cannot be diagnosed by them or the public but only by one who has been specially trained in medicine in all its branches of anatomy, physiology, pathology and bacteriology;—than by placing the nervous system of the patient in a calm restful state the means a medical man uses to the same ends is rest in bed and good nursing, the Christian Scientists' treatment ends there, the doctor's begins there.

Hence in certain illnesses,—not diseases in strict medical parlance—such for example as have been for years treated in the continental clinics mentioned above, the Christian Scientists score successes the accounts of such cases are passed along by the public from one to another and do not in the passage fail in the telling, and by the time they have reached the last person, they have risen from the status of a cure to that of a miracle.

What of their failures? Their recital does not appeal to the patient's friends and dies a sudden death. It is only occasionally that a death is obviously and directly from a legal point of view attributable to their treatment or I should say their lack of treatment but one can remember such cases, a boy suffering from diphtheria and a man with a bedsore are instances of deaths at the hands of Christian Scientists from lack of medical treatment. I do not for one moment argue that medical science would have saved these lives, but I do say that their chances of recovery would have been much greater everyone must agree with this statement unless he is of opinion that medical science and treatment founded on this knowledge is of no avail such an argument would be as absurd as saying that the man in the street knows as much about chemistry as a chemist, or about astronomy as an astrologer, or about mathematics as a senior wrangler, or about law as a lawyer.

The history of Christian Science methods is on these lines—Once by chance some person made the discovery that by concentrating his thoughts in prayer on a sufferer and aiding the sufferer to concentrate his thoughts also on the suggestion that because ———— therefore his pain had gone or was non-existent. I have left the premise of the syllogism blank and only put in the conclusion, for I do not propose to deal with the Christian Scientist theory. He found that in some cases after several such seances the patient was cured of his illness. I have already stated the class of cases where this result obtains.

The psychological explanation is clear the Christian Scientist and his patient both fulfil the necessary preliminary condition of faith and confidence by concentration of thought, in this case by means of religious ideas, a partially subjective state is induced in both, more in the former than the latter in this state their subjective minds are *en rapport* and the suggestion of cure is given and worked on repeated seances

are necessary, because the hypnotic or subjective state is only partial, and hence the result of the suggestion not very potent.

This discovery was attributed to a power present in all if they acted in conformity with Christian Science methods, and under that condition only. It will be seen how incorrect is this many methods may be used to produce this subjective state, any method in fact which provides for, first, the implicit faith and confidence in the operator, and second the necessary concentration of mind the methods have already been mentioned they are by passes, by crystal gazing and by the tiring of certain ocular muscles, by the laying on of hands, by prayer, by suggestion.

In short, Christian Scientists have stumbled on a psychological fact, but they have given to it an incorrect explanation—a fact one can afford to overlook they do not, however, stop here but in their ignorance they attribute to it miraculous powers which it does not possess, and this spells disaster and death to many of the willing victims who are willing to sacrifice themselves on this altar of misapprehension and ignorance.

REPORT ON AN EPIDEMIC OF DENGUE CONSISTING OF BOTH A THREE DAY AND SEVEN-DAY FEVER TYPE AMONG THE 15TH LANCERS AT SIALKOT, 1907

B. H. FOOKS,
LT COLONEL, I.M.S.

A SEVERE epidemic of Dengue occurred in the above Regiment at Sialkot, lasting from the 1st October to the 15th November.

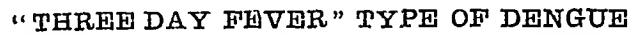
It was especially interesting from the fact that it took the form of two distinct types, a three-day and a seven-day fever type. The epidemic may be divided into three periods. The first period lasted about ten days and consisted of cases of the ordinary three-day fever type, the second period of three weeks consisted for the most part of a very severe seven-day fever type, and the third or last period of about a fortnight, consisted of both the three-day and a mild form of the seven-day fever type.

THREE-DAY FEVER TYPE

The three-day fever type, "so called because the primary fever only lasted three days" were typical cases of Dengue. The primary fever rapidly rose to 102° or 103° and lasted about three days, it was accompanied by an erythematous rash on the face and neck, frontal headache and severe pains in the lumbar region, and was followed by an intermission of fever from 3 to 4 days, and by the secondary fever on the seventh day. This secondary fever was ushered in by increased headache, but only rose to about 100° and was of very brief duration and extremely liable to be overlooked unless specially looked for.

THE SEVEN-DAY FEVER TYPE

The symptoms of this type were much more severe and very constant and regular. The invasion was very sudden, the temperature



REPORT ON AN EPIDEMIC OF DENGUE CONSISTING OF BOTH A THREE-DAY AND SEVEN-DAY FEVER TYPE AMONG THE 15TH LANCERS AT SIALKOT, 1907

By Lieut Col H FOOKS, 1118

MILD "SEVEN-DAY FEVER" TYPE OF DENGUE

CHART I

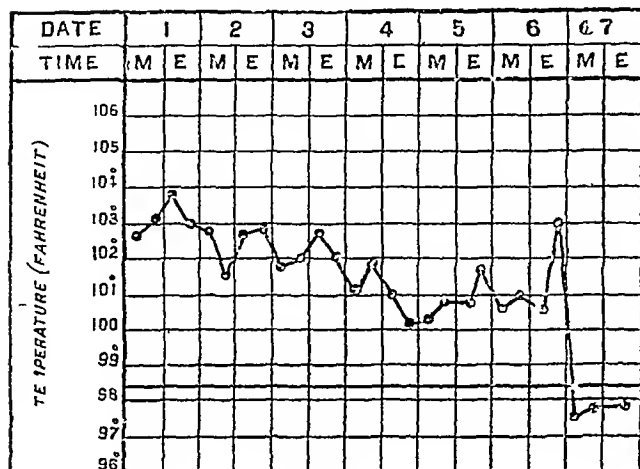


CHART II

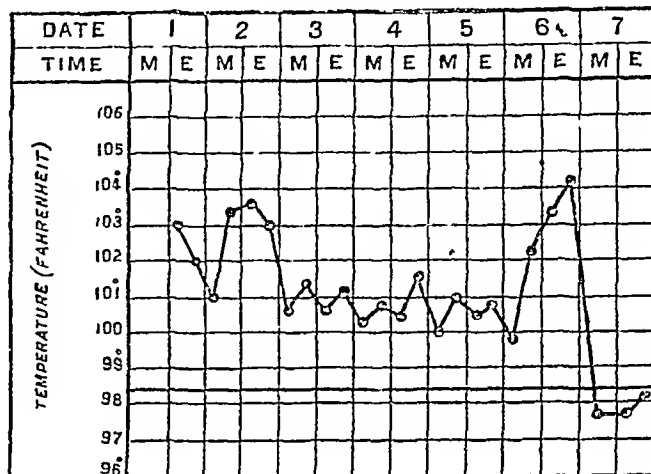


CHART III

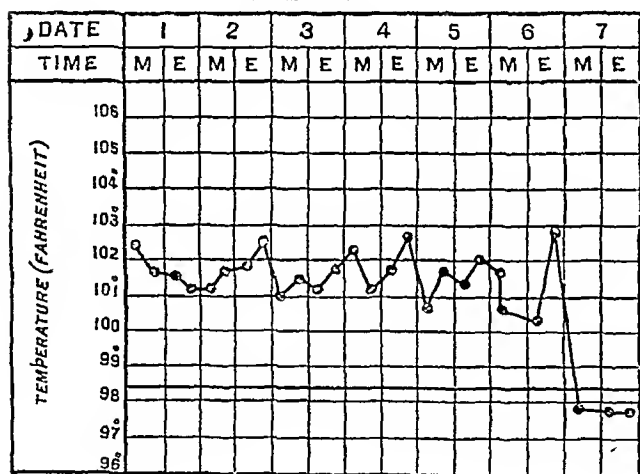


CHART IV

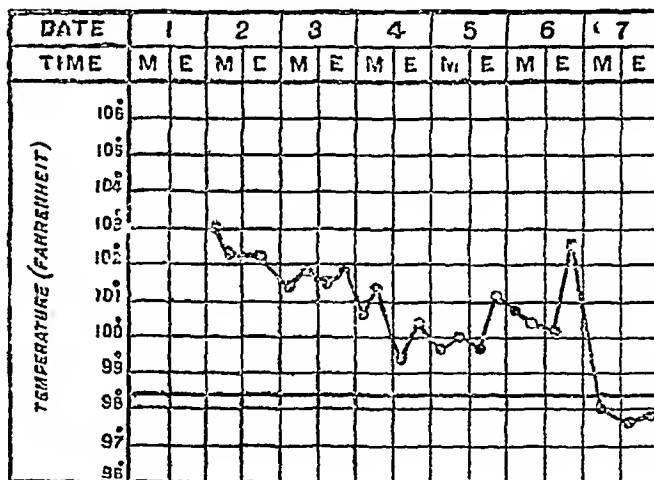


CHART V

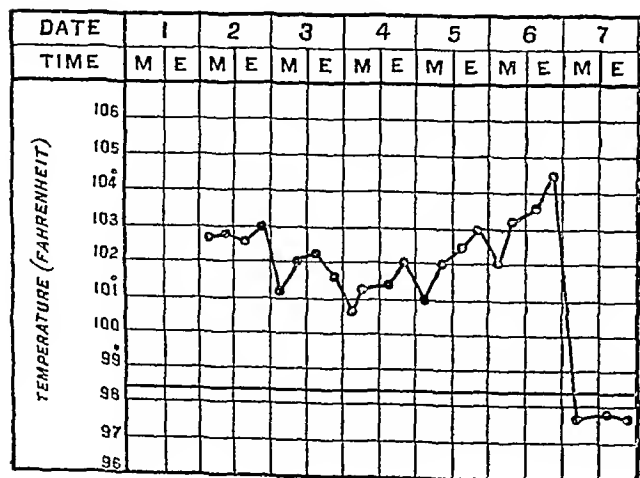
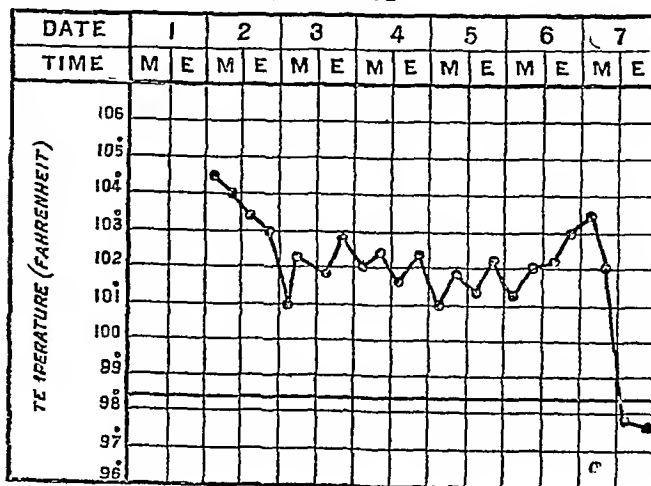


CHART VI



REPORT ON AN EPIDEMIC OF DENGUE CONSISTING OF BOTH A THREE-DAY AND SEVEN-DAY FEVER TYPE AMONG THE 15TH LANCERS AT SIALKOT, 1907

By LIEUT-COL H FOOKS, I M S

SEVERE "SEVEN DAY FEVER TYPE" OF DENGUE COMPLICATED BY BENIGN TERTIAN

CHART I

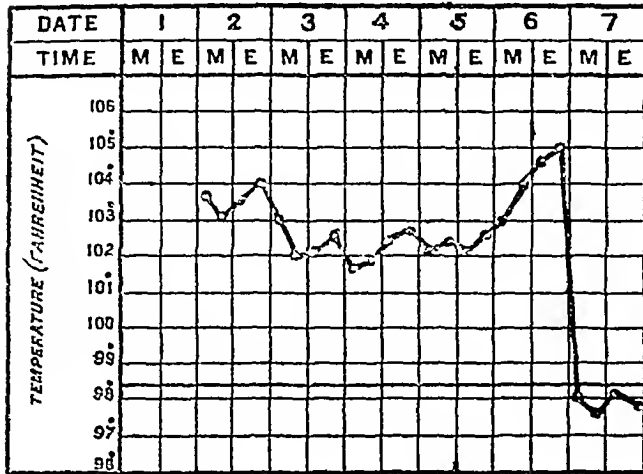


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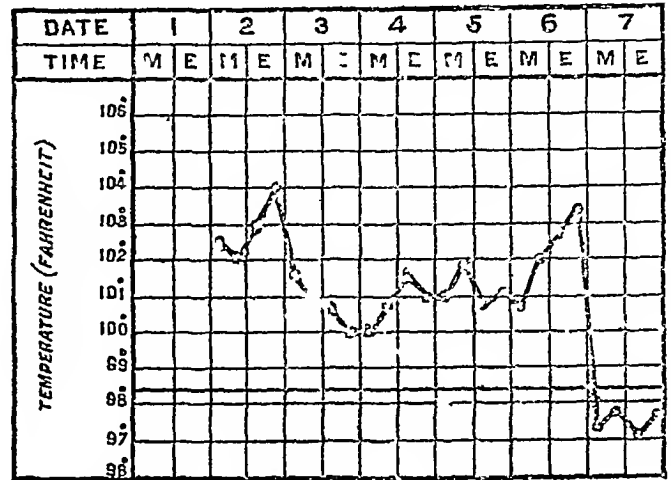


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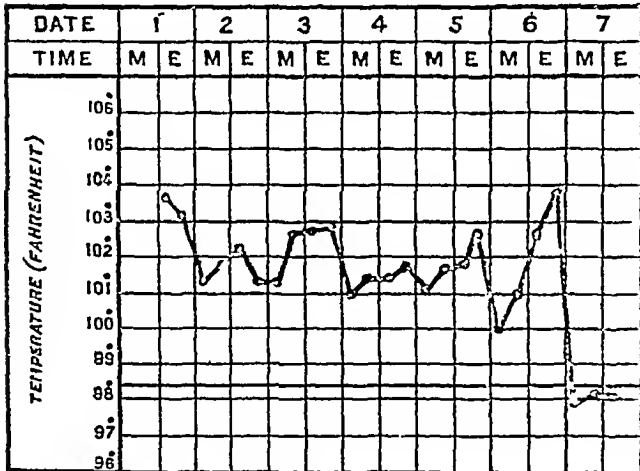


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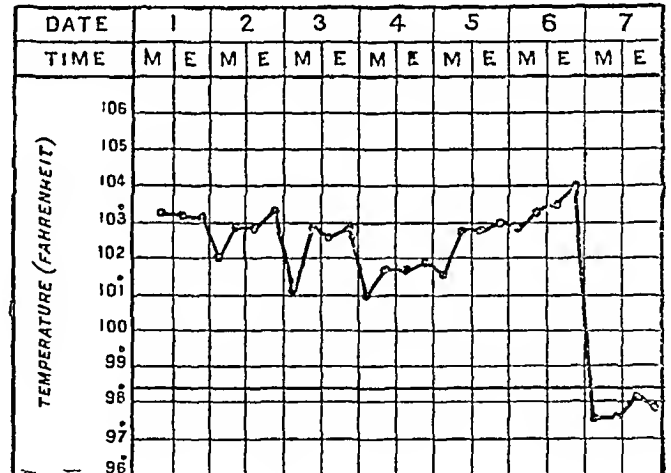


CHART V

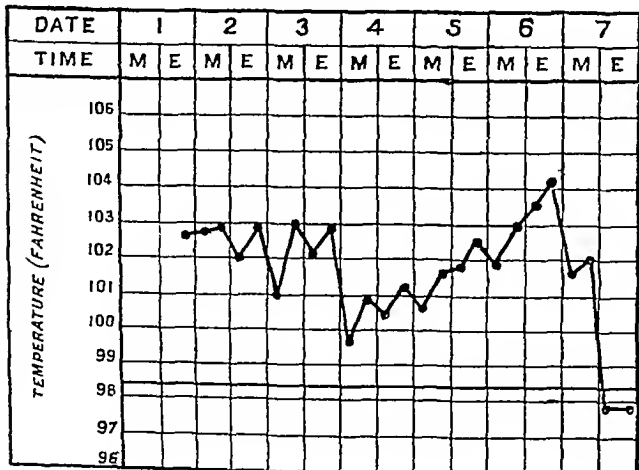
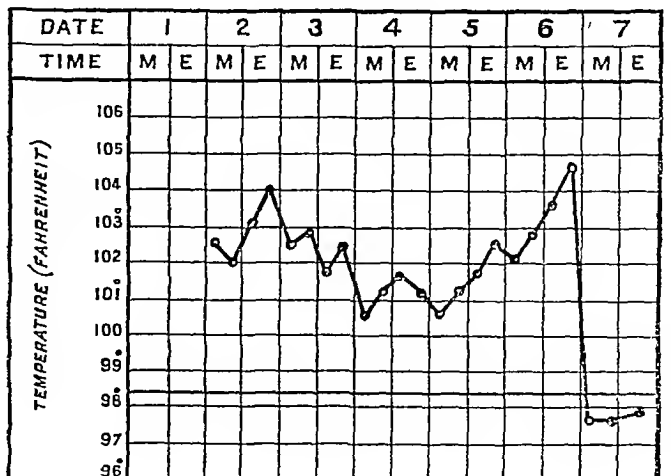


CHART VI



rapidly rising to 103° or 104° with intense frontal headache especially at the back of the eyes, excruciating pains in the lumbar region and back of thighs, and in a few cases also in the knees. The face was very flushed, puffy, and often swollen, the conjunctiva was much injected, prostration and lethargy were very marked, and it was only with difficulty the patient could be roused to answer questions, the tongue was red at the tip and edges, and moderately coated with a silvery fur on the dorsum with prominent red papillae. The throat was sore, the fauces especially being congested. The bowels were regular. The pulse rate was from 80 to 100 at the commencement of the illness, but much slower towards the end, especially during the terminal rise, in several cases at that period it was only 70 with a temperature of 103° , it was also very slow after the crisis, often falling below 50. Epistaxis was present in a few cases. The spleen was not enlarged in any case. There was a history of a rigor at the beginning of a few cases, but no rigors or perspirations during the illness. A mottled secondary rash occurred in a few cases, and was followed by slight desquamation. The temperature was the most characteristic feature, and remained up throughout the whole course of the illness, it rapidly rose to 103° or 104° and after remaining high for two or three days, was followed by a slight remission of three or four days, and a high terminal rise of about 104° immediately before the crisis on the seventh day. The crisis usually occurred during heavy sleep. The duration of the fever was not influenced by quinine.

Convalescence was slow, the pain in the lumbar region remaining several days after the crisis.

The mild form of seven-day fever came midway as it were between the other two types. The general symptoms were much less severe, and the remission of temperature more marked, it evidently being an attempt at an intermission. The terminal rise was high, resembling an exaggerated secondary fever of the three-day fever type.

There were 140 cases in all, exactly 20 per cent of the Regiment being affected, 65 being of the three-day, and 75 of the seven-day fever type.

All the cases recovered, excepting one who developed Pneumonia on the fourth day of his illness. Relapses occurred in four cases only, and it was noticed that they only occurred in very weakly men. The incubation period was not more than four days, proved by several men being attacked who had not been more than four days in the station, and also by the rapid cessation of the epidemic when the Regiment went into camp.

Treatment consisted of simple saline diaphoretics together with bromide and salicylate of soda for the headache, and pains in lumbar region. Quinine had no effect on the fever, it was tried in large doses both by the mouth and intermuscular injections, but only increased

the severity of the headache and had to be discontinued.

Microscopical examination of the blood was very interesting. No visible organisms could be found to account for the dengue, but in 16 out of 20 of the most severe seven-day fever type, malarial (Benign Tertian) parasites were found. Although a large number of cases of both the three-day fever and mild cases of seven-day fever were examined, no malarial parasites could be found in them, but only in the most severe seven-day fever type. It was also noticed that the more severe the symptoms, the more numerous were these malarial parasites, and that they were more prevalent at the beginning and disappeared towards the end of the illness.

NOTES.—There is no doubt but that these cases of both seven-day and three-day fever were dengue. Colonel McCloghry, I.M.S., Principal Medical Officer at Sialkot, very kindly saw them with me and agreed as to the diagnosis. The two types were much alike in many points, and the total duration of the disease was the same in both, namely, seven days.

Both the secondary fever of the three-day and the terminal rise of the seven-day fever appeared to be an attempt at a relapse cut short by antitoxins.

Epidemics of disease vary in severity, and their virulence often decreases towards the end of an epidemic without any accountable cause, and it may be, that the seven-day type of fever in this epidemic was simply a virulent type of dengue with a customary decrease in severity towards the end of the epidemic, the presence of malarial parasites being purely accidental. It is probable, however, that anything that tends to lower the vitality of the constitution may cause dengue to take the more severe seven-day fever type, therefore considering the large proportion of these cases which microscopical examination proved to be infected by malaria I am of opinion that the severity of the symptoms and the prolongation of the fever to seven days in this epidemic was in some cases due to double infection by both dengue and malaria, and in others to the fact that the men were in a weak state of health on account of the fast of *Ramzan*, which the Regiment, being composed entirely of Mohammedans, were keeping at the time.

One very interesting case occurred complicated by scurvy which had two distinct relapses, both the severity of the symptoms and the relapses being due, in my opinion, to the case being complicated by scurvy.

It is noteworthy that the most severe cases occurred during the malarial season, and that a number of men who returned from furlough on October 15th much infected by malaria suffered most from this severe type. The other native Regiments in the station did not suffer from the disease, but remained unusually healthy.

I have not yet been able to obtain Rogers' report on the seven-day fever of Calcutta, but from his paper on "Malarial Fevers among Europeans at Calcutta and their differentiation from the seven-day influenza like fever," it appears that the seven-day fever of Calcutta must be very similar to the seven-day fever of this epidemic, the chief characteristics of which were—

1 The intense frontal headache especially at the back of the eyes, combined with great nervous prostration

2 The excruciating pain in the lumbar region

3 The slow pulse especially during the terminal rise

4 Tongue red at tip and edges, but slightly coated on dorsum with a silvery fur and red papillæ showing

5 The temperature, consisting of two or three days' high fever followed by a slight remission, and terminal rise immediately before the crisis on the seventh day

6 The absence of rigors and perspirations during the illness

The disease was spread uniformly throughout the Regiment, and I am strongly of opinion that it was conveyed by sand-flies, which were very plentiful at the time on account of a very dry autumn. In the spring of 1899 when in charge of a Field Hospital at Landi Kotal, I saw over 100 cases of dengue, two cases only of which were of the seven-day fever type, and have always considered it was caused by sand-flies on that occasion. It was certainly not due to mosquitoes as none were present.

My thanks are due to Captain R. M. Barron, I.M.S., for kindly conducting the microscopical examination of the blood for me

A NEW METHOD OF CARRYING WOUNDED OFF THE FIELD ON SERVICE

By J. S. O'NEILL, M.B.,

LIEUT., I.M.S.

A SIMPLE and effective method by which wounded men can be carried off the battlefield. The only appliances necessary are field service puttees, and rifles.

THREE METHODS

- 1 By means of one puttee
- 2 By means of two puttees
- 3 By means of two puttees attached to two rifles

1 METHOD BY MEANS OF ONE PUTTEE

One puttee is placed well forward under the buttocks of wounded man, and tied into a loop 84—88 inches in length by reef knot, placed at one side (*vide* No. 1 photo). Rescuer bends down facing away from injured man, and applies loop of puttee over forehead [or applies puttee around back of neck below collar of coat, and over hollows of shoulders in front (*vide*

photos)], and by this means wounded man is carried (*vide* photo). Time employed in applying puttee 15 seconds.

2 METHOD BY USING TWO PUTTEES

(1) One puttee placed under buttocks of wounded man, and over forehead (or around nape of neck, and over shoulders) of rescuer, as in first method.

(2) Second puttee overlapping first puttee, and passing round the middle of back, and under armpits of wounded man, and under armpits, and over front of chest of rescuer, and tied at one side by reef knot and forming a loop 72 inches in length. Time employed in applying two puttees 22 seconds.

By these means wounded men can be carried with great ease for considerable distances (1 to 2 miles), hands being free to carry rifles, especially useful over broken country and in hill warfare, but equally useful in the plains. The photos show the method of carrying by puttee applied over forehead. Other photos show method when puttee applied over shoulders of rescuer.

The puttee employed was the field service puttee, khaki, length 9 feet 3 inches, breadth $4\frac{1}{2}$ inches, tape 6 feet in length, breaking strain 232 lbs (16 st 8 lbs).

When two puttees are employed, only about two-thirds of the weight is on the lower puttee.

3 METHOD BY MEANS OF RIFLES AND PUTTEES

Two puttees are applied to two rifles, forming nine bands from muzzle to butt.

The rifle bolts are removed, and the cartridges withdrawn.

The two rifles are placed with trigger-guard uppermost, and the two puttees are applied to the rifles forming nine cross bands uniting the rifles and forming an improvised stretcher—

1st band passing from barrel of one rifle to piling swivel of the other.

2nd band, from piling swivel to fore end.

3rd band, fore end to outer band.

4th band, outer band to hand guard.

5th band, hand guard to front of magazine.

The second puttee is here knotted to first puttee.

6th band, magazine to trigger guard.

7th band, trigger guard to small butt.

8th band, small butt to butt swivel.

9th band, between butt swivels.

Puttees applied to rifles by simple hitch, and arranged at such parts of the rifle, so as to prevent slipping. Length of stretcher thus formed by puttees, is about 44 inches, breadth about 15 inches.

Method by means of rifles is useful where men are seriously injured, head can be carried level, head at butt end, legs allowed to hang down at muzzle end of rifles.

The two straps of rifles can be tied over chest of wounded man, when carrying over rough country (*vide* photo). Distance of transport

A NEW METHOD OF CARRYING WOUNDED OFF THE FIELD ON SERVICE

By LIEUT J S. O'NEILL, M B, I M S



No 1

Method No 1—Puttee applied under buttocks of wounded man and around forehead of rescuer



No 2

Method No 2—Two puttees employed raising wounded man



No 3

Method No 3—Carrying by means of two puttees (side view)

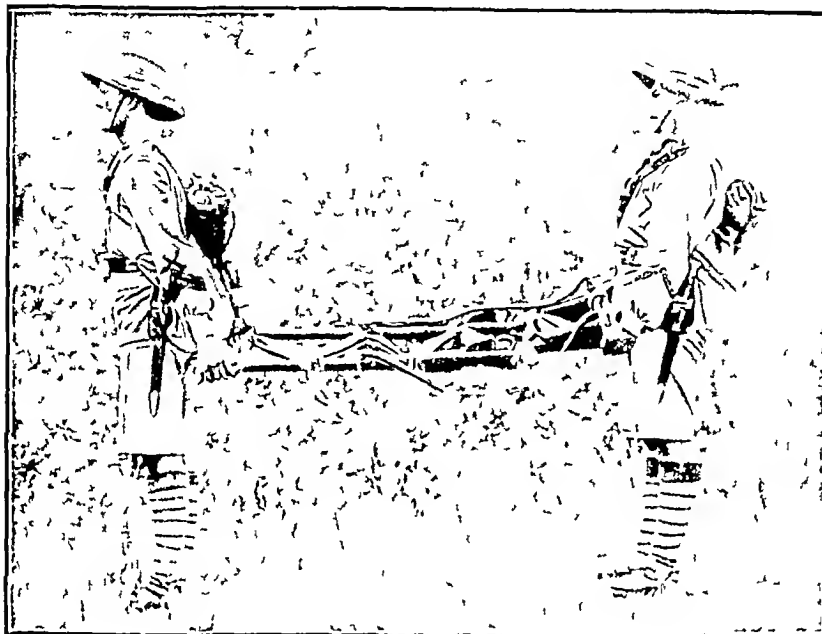


No 4

Method No 4—Employing two puttees, first puttee passing under buttocks of wounded man and over shoulders of rescuer, second puttee passing around back of wounded man and under armpits and over chest of rescuer. This method can be universally employed.

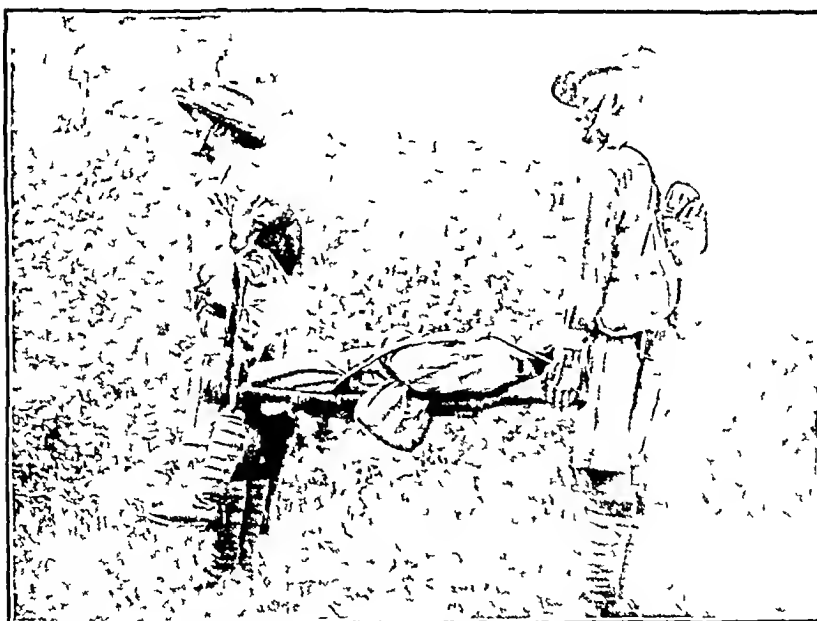
A NEW METHOD OF CARRYING WOUNDED OFF THE FIELD ON SERVICE

BY LIEUT J S O'NEILL, M.B., I.M.S.



No 5

Method No 3—Two puttees applied to two rifles forming an improvised stretcher



No 6

Method No 3—Carrying wounded man on improvised stretcher formed by two puttees applied to two rifles. The straps of the rifles are tied across chest of wounded man by means of a bandage, very useful over broken country and in hills

by this method over 900 yards, time employed in applying puttees less than 1½ minutes

These three methods are specially useful in hills, or over broken country, but equally useful in the plains and where no stretchers or other appliances are at hand

The advantages are, that all men on service are supplied with puttees and rifles, no extra appliances are necessary, the great ease with which wounded men can be carried for considerable distances without fatigue. In methods 1 and 2, only one available man is taken from the field, and in method 3, two men are temporarily absent from the field. Experiments have been made by employing these methods during the last seven months, and they were found to work satisfactorily. The men with a little practice can apply the puttees with great rapidity. These methods can easily be taught to all men of the regiment of both British and Native troops

REPORT ON 50 CASES OF BERI-BERI IN THE REFORMATORY SCHOOL, ALIPUR

BY F J DALEY,

LIEUTENANT, I S M D,

Assistant to Civil Surgeon, 24 Parganas

THE first case was observed on the 5th September in a boy aged 16 years, a native Christian. He had been nearly three years in school and was in the band. Two or three days previous to admission to hospital he felt a peculiar pain and tingling sensation in the lower extremities and a feeling of general debility. His bowels were constipated, tongue furred and appetite moderate. He had occasional attacks of palpitation, while the pulse varied from 80 to 90 beats, the interval or pause between the beats being practically equal. There was puffiness of the face, slight oedema of the legs and feet, more marked over the shins than on the calves. His symptoms gradually subsided under rest and treatment, and he was discharged to the convalescent gang. After a period of about 20 days in the convalescent gang, he had a slight relapse of oedema and ultimately at the end of 45 days he was discharged and sent to light duty.

Two other cases were admitted on the 7th September and two more on the 9th. Of these four cases two proved fatal—

Rajendra Dutta, admitted on the 7th, and Chandra Magh, admitted on the 9th September, respectively.

In the case of Rajendra Dutta, the symptoms, on admission, indicated the disease in a mild form. Temperature, slightly subnormal, oedema of the lower limbs and face, marked, gait, ataxic, pain and tenderness in the calves, knee-jerk, absent, hyperæsthesia in the lower extremities, irritability of the heart, urine of low specific gravity and of acid reaction. He gradually improved under treatment, but, on the 28th day after admission, he suddenly got a relapse

accompanied by diarrhoea, vomiting, increased dropsy (including the abdomen) and complete paralysis of the lower extremities with marked hyperæsthesia of the calves. There was also a marked initial *bruit* with throbbing of the vessels of the neck and dyspnoea and an increased area of cardiac dulness which extended downwards. The urine was scanty and high coloured, sp gr 1010, reaction, acid. His temperature rose five days previous to his death, the maximum being 104° F. His face became cyanosed and he gradually sank from coma and died on the 23rd October, 47 days from the date of his admission into the hospital. A copy of the *post-mortem* examination is attached.

The second fatal case, that of Chandra Magh, occurred on the 21st September, 12 days after admission into hospital. In this case the ataxic symptoms were well marked, terminating ultimately in paralysis of the lower extremities. His general symptoms were much the same as in the case of Rajendra Dutta, already described, with the exception that there was marked pericarditis, continuous vomiting of a greenish fluid matter and blood stained stools. There were also symptoms of peritonitis about six days before his death, with a continued temperature, up to 103° F and a slow, feeble pulse. His urine was scanty, high coloured, the reaction being acid and sp gr 1012. He retained consciousness to the end and died from cardiac failure on the 21st September. Copy of *post-mortem* report is attached.

The following table will show the dates of admission into Hospital and the kind of rice food issued—

Date of admission to hospital	No of cases	Rice food
5th September 1907	1	Burma Rice
7th September 1907	2	"
9th September 1907	2	"
11th September 1907	2	"
15th September 1907	1	"
16th September 1907	1	"
21st September 1907	1	"
23rd September 1907	2	"
24th September 1907	3	"
25th September 1907	3	"
26th September 1907	8	"
27th September 1907	1	"
1st October 1907	2	"
5th October 1907	2	"
6th October 1907	1	"
8th October 1907	4	"
9th October 1907	2	"
10th October 1907	2	"
11th October 1907	1	"
		Burma and country rice was issued in equal proportions to the healthy boys
13th October 1907	1	"
14th October 1907	1	"
18th October 1907	2	"
25th October 1907	1	"
31st October 1907	1	"
5th November 1907	3	"
TOTAL	50	
September	27	
October	20	
November	3	
• TOTAL	50	

Out of a total population of 200 boys in the school there were 50 cases of beriberi, of which 2 proved fatal. The largest number of admissions in one day was 8, on the 26th September. The hospital being limited to 10 beds, the upper storey of a workshop was taken over as a special hospital, a well-ventilated double-room with accommodation for about 30 boys. The cases admitted during the month of September were more or less severe, but those occurring in October and thereafter were of a milder type.

Analysis of symptoms—Œdema—This was the first symptom noticed on arrival of the patient in hospital. The majority of the patients stated that they felt a certain tingling sensation and weakness in the lower extremities, while others declared that they felt a numbness in the legs. The œdema was usually well marked on the shin bones—it seemed to vary, being well defined for a couple of days and then apparently disappearing only to appear again. In the majority of cases it was limited to the feet, legs and face—in a few it was limited to the feet only. The more serious cases, however, showed general dropsy.

Nervous symptoms—

Knee jerk	Normal in	18 cases
	Absent in	17 "
	Diminished in	10 "
	Exaggerated in	5 "

Romberg's sign was present in some cases, only especially those having an ataxic gait. Although tingling and numbness of the lower extremities were early symptoms noticed by the patients in general, before admission to the hospital, yet there was one case in which the tingling sensation also affected the hands. In rare instances anæsthesia was noticed along the shin bones and dorsum of the feet. In all the ataxic cases the gait gave the appearance of locomotor ataxy with heel drop, and marked Romberg's sign. Paresis occurred in 8 cases, indicative of peripheral neuritis with marked ankle drop.

Circulatory symptoms—Anæmia was a general symptom, well defined in about half the cases. The pulse rate was invariably increased with diminished tension.

Cardiac symptoms—Palpitation was a prominent symptom and increased action of the heart in all the cases. Two were admitted with marked mitral bruit, which under treatment gradually disappeared. One case of mitral bruit occurred after admission—which became greatly exaggerated and will probably be permanent. In three cases there were signs of dilatation and in two cases of hypertrophy of the heart accompanied with pericardial pains. There were three cases of pericarditis with effusion, two of which proved fatal.

Urinary symptoms—In all the cases the urine was examined. The specific gravity was rather low, from 1005 to 1012, and in no case

was albumen detected. The reaction in every case was acid.

Gastro-intestinal symptoms—Constipation was the rule on admission. In six cases, as the disease advanced, purging and vomiting occurred, in two of which (the fatal cases) these symptoms became greatly exaggerated. In three other cases there were traces of blood in the stools, one of which was typically dysenteric. As a rule, the appetite was good.

Respiratory passages—In no instance was the throat or lungs affected.

Clinical temperature—The temperature was usually sub-normal. In 13 cases, however, the temperature rose, varying from 100° to 105° F, lasting only from two to five days. Two of these cases were probably malarial. Three other cases appeared to be of an inflammatory nature—(Pericarditis and Peritonitis)—two of which terminated fatally.

Relapses—Two boys were re-admitted to hospital after being discharged to the convalescent gang in consequence of a slight recurrence of œdema, noting the inclination to a relapse, greater precautions were taken with regard to discharging patients both from the hospital and convalescent gang.

Treatment—Segregation—A special barrack, commodious and well-ventilated was taken over. Rest—This was looked on as an important factor and care was taken in the selection of attendance. The diet was ample and good milk, soups, butter, bread and stimulants, port wine and brandy. Medicinally—Salines, Steel, Digitalis, Strychnine, Thymol, Morphia, and Cod Liver Oil.

Amusements were not neglected.

REMARKS	
Occupations of the boys affected —	
Carpenters	11
Blacksmiths	6
Cooks	1
Cane workers	2
Book-binders	4
Tin smiths	3
Band boys	10
Compositors	3
Printers	3
Polishers	1
Tailors	3
Outside printers	3
TOTAL	50

Food—Burma rice was issued from the beginning of April 1907 up to which time the ordinary country rice of good quality was used. The Burma rice was given to the boys generally with the exception of the hospital patients and a few Eurasian lads—15 altogether out of a population of 200 boys. At the beginning of the outbreak a suspicion arose as to the Burma rice being the cause. In consequence samples of Burma rice were forwarded to the Deputy Sanitary Commissioner, Bengal, and to the Imperial Agricultural Chemist, Pusa. The

former found no toxine in rice and the report of the latter was "a minimum of weevil marks." On the suggestion of Lieut-Col E H Brown, M D, I M S, an experiment was then made, by dividing the boys into two batches, one receiving Burma, the other ordinary country rice. This experiment began on the 12th October, after which date there were only ten more admissions to hospital from Beri-Beri, all from the Burma rice batch.

It is noteworthy that none of those fed on country rice, including the Eurasian lads, and those in hospital took the disease.

The other articles of food consisted of—Meat, fish, fresh vegetables, dhal and spices, all fresh and of good quality. The cooking was well looked after under the direct supervision of Mr Walsh, the Superintendent, and his assistant, Baboo N N Pal.

There is a dairy on the premises for the supply of milk to the school.

In the centre of the school there is a large tank—the water of which was submitted to the Health Officer, Calcutta, for analysis. The result of which is satisfactory.

The water of this tank is used for garden purposes only, the greatest care being taken that it is not used in any way by the boys. The water-supply for drinking, culinary and bathing purposes is the filtered municipal water.

The ventilation of the sleeping barracks is not quite satisfactory—the space for each individual being too small. In all other respects the school is in a most sanitary state.

I would particularly draw attention to the following as a matter for consideration in view of tracing the origin of the disease. Beri-Beri, it is probable, remains dormant for an indefinite period before manifesting itself. On this theory it is very likely that the disease was imported by the fourth case admitted to hospital—a Magh from the Chittagong Hill Tracts—who was five months in the school before the epidemic broke out.

This hypothesis would seem to be borne out by the fact that two other Maghs were admitted into the school on the 1st December with suspicious symptoms of the disease, and were in consequence placed in quarantine. It may also be noted that a temporary Warder employed to watch the boys in the special Beri-Beri hospital contracted the disease 14 days after his engagement. It would be interesting to know whether bugs or lice (the school has a fair share of the former especially in the cubicles) formed any medium of communication? It is very noteworthy that in the Alipore Central Jail, which is separated from the Reformatory School by about 150 yards, and whose daily population is about 2,000, there was not a single case, though Burma rice was exclusively used in the jail.

In conclusion, I would state that Civil Hospital Assistant S K Chakravarty, the resident

Medical Officer of the school, has helped very much in the compilation of these notes.

Post mortem examination held on the body of Rajendra Dutta, who died in the Reformatory School, Alipore, on the 23rd October 1907. Autopsy 8 hours after death.

There were no external marks of violence on the body. Rigor mortis was strongly developed in both extremities. The feet were extended and the hands half closed. The tongue was within the mouth. There were streaks of blood (dry) running down both sides of the face from the nostrils. The pupils were dilated and the conjunctivæ jaundiced.

Brain—Weight 39 oz.

The longitudinal and lateral sinuses were filled with dark fluid blood, and the membranes of the brain were intensely congested. On section of the brain its substance appeared normal. Puncta Cruenta were numerous and prominent. The choroid plexus was congested and the lateral ventricles contained a small quantity of coloured serum.

Thorax—On opening the thorax the left pleura anteriorly was extensively adherent to the chest wall from recent adhesions as also that portion covering the heart, further examination showed that the pleurisy extended to the sides, and the posterior surface of the left lung, the whole being covered with recent and fresh lymph.

Lungs—Left, 16½ oz.

There were numerous extravasated spots on its external surfaces which varied in size. It was intensely congested and crepitation was diminished. On section and pressure it exuded sanguis frothy material.

Right Lung—Weighed 17 oz.

Marked also by extravasated patches like the left lung and was also intensely congested and of the same character as the left.

Heart and Pericardium—Heart weighed empty 8½ oz. The pericardium contained about 1½ oz of deep straw coloured serum. The heart was distended, the right apparently more than the left. The coronary vessels were marked. On its external surface there were numerous extravasated patches of blood, irregular in outline, ranging in size from a pin point to a 2-anna piece, they were scattered but appeared to be mostly on the right side. Both sides were distended, but chiefly the right with dark clots in the auricles and dark fluid blood in the ventricles.

Kidneys—Right, 3 oz, left, 3½ oz. Both were deeply congested and the capsules stripped easily.

Liver—38½ oz. Deeply congested. The gall bladder contained about 2 drs of dark fluid bile.

Bladder—Contained about 6 oz of high coloured urine.

Peritoneum—Congested—the cavity contained about 8 oz of serous fluid which suspended numerous flakes of lymph.

Stomach—Contracted—it contains about 2 oz of milky fluid. The mucous membrane was raised and softened and was generally congested, the duodenum showing the same character.

Intestines—The coats of the intestines showed a state of general congestion and was empty.

Spleen—Weight 6 oz, congested.

Remarks—All the serous membranes, pericardium, pleura and the peritoneum more or less showed signs of recent inflammation, numerous patches of yellowish lymph was found on their surfaces. The mesentery in connection with large intestines and kidneys was specially marked with recent lymph.

A *post-mortem* report held on Chandra Magh No 457. Aged about 15 years—admitted to hospital on 9th September 1907 and died on 21st September 1907.

Autopsy about 9 hours after death.

General condition—The body was fairly well nourished and rigor mortis was present in both extremities.

The abdomen was slightly distended and the lower extremities were cedematous, face cyanosed and lips blue

Brain—Weight 38 oz—

The membranes and sinuses of the brain were deeply injected and the subarachnoid space contained about 4 oz of dark red fluid material

Lateral ventricles contained a small quantity of coloured fluid

Thorax-Pleura—The pleurae were adherent by recent adhesion to the chest wall and contained a small quantity of sero sanguinous fluid

Pericardium—Pericardium was considerably distended and thickened, and it contained about 4 to 6 drs of deep coloured serum

Heart—Weight 8½ oz Fall

On opening the pericardium the coronary vessels appeared to be intensely congested and the heart much exaggerated in size. On section the cavities were widely distended and walls hypertrophied and contained dark clotted blood, especially the right auricle

Lungs—Weight, left, 14 oz, right, 16 oz

Both the lungs were intensely congested, indicative of the first stage of pneumonia, they exuded on section and pressure abundance of cannie frothy fluid

Abdomen, Peritoneum and Alimentary Canal—On section the peritoneal cavity contained about 12 oz of straw coloured fluid. The peritoneum was congested and there was some yellowish lymphic material attached here and there in patches. The external coat of the stomach was considerably bile stained

Liver—Weight, 43 oz

Liver was congested and the gall bladder was full, containing 4 drs of dark greenish fluid

Kidneys—Right, 3 oz, left, 3½ oz

Both were deeply congested, the capsules stripped easily

Bladder—Contained 8 oz of high coloured urine

A Mirror of Hospital Practice.

SOME NOTES AND OBSERVATIONS ON 310 CONSECUTIVE OPERATIONS FOR EXTIRPATION OF THE LACHRYMAL SAC

By R. H. ELLIOT, M.D., B.S. (LOND.), D.Sc. (ED.), F.R.C.S. (ENG.), &c.,

MAJOR, I.M.E.,

Superintendent of the Govt. Ophthalmic Hospital, Madras

EXTIRPATION OF THE LACHRYMAL SAC

In the *Indian Medical Gazette* of August 1905, the writer published the results of 47 operations for the removal of the lachrymal sac, which he had performed in 12 months in the Government Ophthalmic Hospital, Madras. In the present paper he proposes to deal with 310 consecutive operations of the above nature performed on 235 patients, and to discuss the results obtained

Those operations were performed in hospital and private practice in Madras between May 5th, 1904, and October 8th, 1907 (3½ years). A number of operations have been since performed and are still coming in, but cannot be included in the present paper. The relief afforded may in some measure be gauged by the increasing

popularity of the operation, as judged of by the following figures—

From May 5th, 1904, to May 5th, 1905, 47 cases

From May 6th, 1905, to May 5th, 1906, 98 cases

From May 6th, 1906, to May 5th, 1907, 125 cases

The practice of medical officers in the Southern Presidency affords additional and not less valuable evidence. Whereas previous to the publication of the above paper in 1905, there was, so far as one can trace, no record of the performance of this operation, in South India, there are now, to my knowledge, five medical officers who having seen me perform the operation, have themselves adopted it. Three at least of them have written to me, or told me, that they are fully satisfied, it is all that has been claimed for it.

Indication for Extirpation of the Sac—In the presence of lachrymal obstruction of dacryo-cystitis—

- (1) Dilatation of the sac,
- (2) Purulence of the sac-contents,
- (3) Evidence of previous attacks of phlegmonous dacryo-cystitis, with persistence of the stricture,

(4) A history of long-standing obstruction, combined with inability or unwillingness on the part of the patient to submit to a long course of probe-treatment, or with a timidity which renders it unlikely that such treatment will be persevered in,

(5) The presence of any indication for an operation on the globe of the eye (especially cataract),

(6) The presence of a septic ulcer in the eye of the same side,

(7) Any factor, occupational or otherwise, which increases the liability of the patient to eye-injury. Not a few of our cases of septic ulcers of the cornea in Madras occur amongst fitters, goldsmiths and stone-masons, in all of the above and in many allied trades tiny chips of hard substance frequently fly up and injure the cornea,

(8) The existence of double lachrymal obstruction with evidence of past or present mischief in one cornea is a strong indication for the removal of both sacs

It would be almost easier to point out the indications for the old and conservative methods of dealing with lachrymal obstruction and dacryo-cystitis. They may be stated as follows—

(I) The absence of inflammatory or marked structural changes in the passages, and

(II) On the part of the subject, (1) the courage and patience to persevere through a long, tedious and painful course of treatment, and (2) the means and the leisure to give the necessary time required by the surgeon

In other words, given an early simple case, in a man of means and leisure, we may adopt conservative treatment, always with the proviso, that failing success, we fall back on extirpation of the sac

STEPS OF THE OPERATION

Preliminaries—The operation is performed under chloroform, the patient being prepared in the usual way. The sac is squeezed dry of its contents, which are caught and removed on antiseptic swabs, the face is again washed.

The surgeon sits facing the patient's head as shown in the diagram, the patient's head is towards the light, and his feet away from it, but he is placed obliquely (according to the side), so that the light falls on and illuminates the side of the face on which the operation is being performed. The position of the tray for instruments, of the assistant, etc., are shown in the diagram.

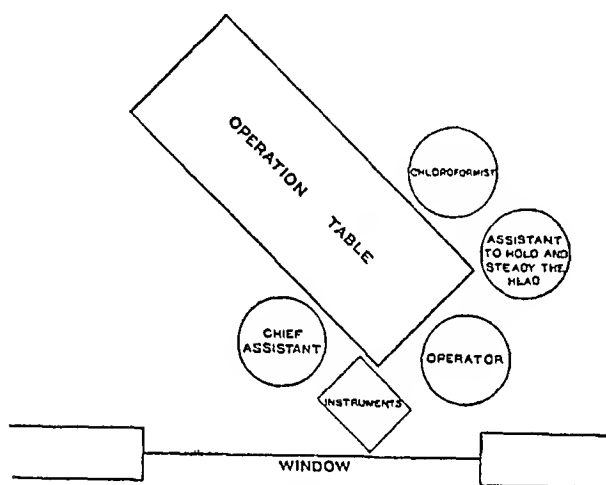


Diagram showing position of Table, Operator, Assistants, etc., for Extirpation of Left Lachrymal Sac

(1) *Skin Incision*.—Define the internal palpebral ligament by pulling the lids outwards, and make the lower border of this the upper limit of the incision, it is practically never necessary to divide this ligament, and it is most advisable not to do so, as when it is divided there is a risk of deformity after healing. Next, define with the finger the anterior lip of the lachrymal groove, and cut boldly down on to this, following its course, with a crescentic incision first downwards and then outwards. The average length of incision in the 310 cases was 20 mm. Easy cases only require an incision 15 to 18 mm long, whilst matted tissues demand much more room (the maximum in any case being 27 mm).

(2) After separating the lips of the wound by the aid of a Muller's retractor, define the layer of fascia which closes in the lachrymal groove, and divide this throughout the length of the skin incision. This may usually be done with the end of a small sharp elevator. With the same instrument, the sac is separated from the adjacent bone, internally and posteriorly. If not adherent, the sac may also be cleaned with the elevator on

its outer side as well, up to the point of entrance of the canaliculi.

(3) The dome of the sac is seized with a fine pair of forceps (conjunctival forceps do well) and drawn firmly downwards, whilst a pair of blunt-pointed scissors curved-on-the-flat, are used to free the dome from its upper attachments (working under the palpebral ligament for this purpose) to cut through the canaliculi, and to follow the sac down into the nasal duct, this duct is divided as low as possible, the sac being pulled firmly up for the purpose.

(4) As large a probe as possible (Nos 9 to 12 Theobald) is then thrust down the nasal duct, till stopped by the palate pushing any mucous membrane in front of it, and a red-hot spindle-shaped cautery is thrust boldly down the duct, to ensure the destruction of this membrane.

(5) The cavity is dried and examined. The removed sac is carefully examined under water and slit open to make sure that no part has been left behind. If any portions have been so left, they are dissected out, and if necessary the neighbourhood of the dome of the wound is cauterised freely with a ball-shaped red-hot cautery.

The cavity is freely flushed with a 1—3000 solution of bin-iodide of mercury, and the wound closed with three skin sutures. An aseptic pad and bandage closes the eye of the operated side, the other being left free.

The case is dressed on the seventh day, when the stitches are removed and the eye is released.

Hæmorrhage is dealt with by means of pressure and the use of adrenalin chloride solution. Any troublesome bleeding point is touched with the red-hot cautery. For pressure I have always used sterilised swabs of cotton wool mounted on stitches 4 inches long, and about $\frac{1}{8}$ inch in diameter.

When the case is complicated by the presence of a septic ulcer of the cornea, the latter is dealt with at the same sitting. Of many methods tried none give such good results as the use of the red-hot cautery, combined with paracentesis of the chamber. Such eyes are opened daily, and protargol solution (1 to 8) is instilled, atropine or eserine are used as indicated.

COMPLICATIONS MET WITH BEFORE OPERATION

- (1) Acute abscess of lachrymal sac, with phlegmonous inflammation of surrounding face
- (2) Lachrymal fistula
- (3) Ulcer of the cornea, especially of the septic type
- (4) Cataract or other deep-seated disease of the eye

With the exception of the first, all these have been dealt with elsewhere in this paper. It is the custom here to incise a lachrymal abscess freely, at the same time curetting its cavity,

and sponging it out with a solution of perchloride of mercury (1 per cent). When the inflammation has subsided, the sac can be removed, it is necessary to wait about a month as a rule. In one case the sac was extirpated within a few days of incision. The circumstances of the patient left no apparent alternative, as otherwise she would have gone away and probably soon had a return of the severe inflammation when she was away from medical aid. As a routine measure such haste is inadvisable.

DIFFICULTIES AND COMPLICATIONS MET WITH DURING OPERATION

(I) The terminal branch of the facial artery should be avoided in the first incision, or it causes troublesome hæmorrhage (*vide* my paper, *I M G*, August 1905).

(II) When the lachrymal sac is not dilated or distended, it is not uncommonly bound down into the lachrymal groove by a dense fascia, which appears to be a backward reflection from the tendo-palpebrarum. This fascia is often very dense, farther when the bridge of the nose is high, and the orbits are consequently deep-set, the plane of this strong band of fascia comes to lie nearly parallel to the median sagittal plane. On the contrary, a low nose-bridge and a flattened type of face throw this fascial plane farther forwards on its outer side, *i.e.*, more into the plane of the face, the obvious result of this latter conformation is to render the wound shallower and the sac more accessible. The former condition has naturally the opposite effect, both the depth of the wound and the plane of the sac tend to embarrass the operator, who may easily burrow outward into the orbit, and mistake a lobule of fat for the sac. Such an accident need never happen, if after a first clean skin incision, the wound is held well open (by a speculum or otherwise), all hæmorrhage is stopped, the nasal margin of the lachrymal groove is well defined with the finger, and the dense fascia cleanly divided as close to this bony edge as possible. The sac is at once seen lying within its sheath of bone and fascia, and the operation can be proceeded with on the usual lines.

(III) Hæmorrhage may be troublesome at three stages (1) after the skin incision, (2) after division of the deep fascia over the sac, or during separation of the sac, and (3) from the nasal duct after the passage of the probe down its length. Firm pressure deals most easily with the first and second, aided if need be by a touch with a pointed cautery over any bleeding spot, the last is best stopped by plugging the wound with a cotton wool swab, to clean and dry it, and then rapidly passing a spindle-shaped cautery down the passage, before it has time to bleed again.

(IV) When there has been preceding phlegmonous inflammation and still more when there

has been a long-standing fistula, the superficial structures are so matted as to be unrecognizable separately. It may even be difficult to recognize the sac itself. If one cuts boldly down on the anterior crest (naso-maxillary) of the lachrymal groove, and separates the sac from the bed of the groove with the elevator, it is not difficult to seize the thickened sac wall in the grip of a fixation forceps, and then to cut the sac boldly out with the surrounding structures, keeping as close to the former as possible.

(V) When one desires to perform a cataract extraction, or other serious operation on the globe of the eye and the lachrymal passages are found (as tested by dropping fluorescein into the conjunctival sac and examining a handkerchief into which the patient is bid to strongly blow his nose) to be closed, even though there may be no very obvious retention, the writer thinks that it is safer to remove the sac, before undertaking the more serious intra-ocular operation. In this class of case it is common to meet with a shrunken, contracted sac, which is tightly adherent to the surrounding parts. If so, the lachrymal groove is opened as usual, the elevator used to force the sac on the inner and posterior aspects and the head of the sac is then seized with forceps, and drawn downwards, whilst the sac is separated snip by snip from the surrounding parts, some of which are necessarily taken with it. The same method is applicable to the cases, where, though the sac can be easily defined anteriorly, internally and posteriorly, it is yet adherent externally to the tissues in its neighbourhood, as the results of long-standing past inflammation. It is a question of operating by feel rather than or at least more than by sight, and it is better to proceed boldly, and if any portion of the mucous membrane is left behind to remove it after stopping all hæmorrhage, when the wound can be freely and well examined. The writer makes it a rule to consider that, if the cavity does not look clean, or in other words, if he is in doubt as to the thoroughness of the operation, the whole of the sac has not been removed. Nothing less than a thorough inspection of the wound should then suffice. A paraffin syringe was obtained for the hospital in the earlier days of this operation with a view to defining the limits of the sac in difficult cases. Before it had time to arrive, farther experience had shown that it was always possible, granted a little perseverance, to thoroughly extirpate any sac. The troubles of paraffin injection have thus been avoided, though it is conceivable that the use of this method would appeal to some, who have not the opportunity of doing many operations of the kind, and who might on this account be only right to use all possible aids. One cannot but think, however, that the difficulties of the operation have been over-estimated, for out of 325 extirpations performed in this hospital during the last 3½ years, there has been only one in which it

was necessary to operate a second time on account of a portion of the sac wall having been left behind, moreover, the case in question was only the fourth of the series and the writer, before commencing extirpation himself, had only seen one previous operation of the kind (by Prof Volckers of Kiel)

(VI) When there is extensive and deep ulceration of the cornea complicating the case, it is necessary to be most careful to avoid pressure on the globe during operation, as otherwise the eye may be ruptured with escape of its contents

(To be continued)

A CASE OF PROSTATECTOMY

By J J PRATT,

LIEUT COL, I M

MIR FIDA HUSSAIN, *æt* 75 years, came under treatment at the Buhampur Hospital, Lucknow, on the 25th September, 1907. He had suffered for the previous three months from symptoms of serious bladder trouble—difficulty in micturition, pain, weight and fulness in the perinæum with alkalinity of the urine and some cystitis. Examination by the rectum and the introduction of a catheter confirmed the diagnosis of enlargement of the prostate. On the 27th September suprapubic cystotomy was performed under chloroform. The vesical wall was fixed to the abdominal parietes by sutures on each side and the bladder opened. The prostatic pouch was occupied by a uric acid calculus subsequently found to weigh a little over three drams. This was removed without difficulty. The prostate was enlarged to about three times its normal size, the whole gland projecting into the bladder as a collar-like enlargement around the meatus. The mucous membrane at the back of the middle lobe was torn through by the light index finger, and the enlarged organ enucleated with the greatest ease in two almost equal portions. The hæmorrhage, which was by no means excessive, was easily checked by means of pressure with hot water sponges. A rubber tube was passed into the bladder and the wound partly closed with deep sutures. Progress towards recovery was uneventful although retarded to some extent by two slight malarial attacks, one on the 9th October and another on the 7th November. The bladder was at first irrigated twice daily with warm boracic lotion. On the 7th October it was noted that the stitches were removed and that the wound was granulating. On the 20th October the tube was removed, on the 22nd some urine was passed for the first time by the urethra, and on the 25th it was noted that the wound was contracting. On November 13th the wound had closed entirely, urine was passed naturally, and the patient was discharged cured.

In my experience cases of enlarged prostate, though perhaps not actually rare, seldom come under treatment in this part of India. This is only the second occasion on which I have had the opportunity of practising the operation which patient and Surgeon alike owe to the ability and energy of a distinguished retired officer of the Indian Medical Service. My first case was treated in the Fyzabad Civil Dispensary some two years ago, but the patient (as so often happens in this country) was removed from Hospital by his relatives before the ultimate result of the operation could be known. In both cases I was much struck with the simplicity of the procedure and the ease and rapidity with which an apparently formidable operation could be carried out.

ANTI-PLAGUE INOCULATION

SOME SUGGESTIONS IN CONNECTION WITH THE REQUISITE APPARATUS

By C E PALMER, M B (CANTAB),

LIEUTENANT, I M

THE following suggestions may be of interest to others of the Indian Medical Service engaged on Plague Duty.

Inoculations have often to be carried out in the district or away from one's main centres, and although the technique is simple, a considerable amount of somewhat bulky apparatus must of necessity be taken. With a view to carrying everything necessary as compactly as possible, I have had a box made for me which answers very well.

I have had it in use some time and find it fulfils all requirements.

The box is made of teak and any intelligent *mistri* can, I think, understand the attached diagram. Cost of box should be about Rs 10.

Compartment A—Contains 300 doses of vaccine.

Compartment B—Two syringes, wool, towels, etc.

Compartment C—Pail steriliser, enamelled basin, etc.

Compartment { D_1 —Each contains an 8 oz bottle in which I carry vaseline, carbolic acid and methylated spirit respectively.

In the lid, fastened by means of brass catches, are the thermometer, a pair of forceps and a small spoon (the latter for removing vaseline from the spare supply). In connection with the box I take a folding table and a portable washing-stand with basin.

The whole of the above apparatus can, if necessary, be carried by one man.

Indian Medical Gazette

FEBRUARY, 1908

CHOLERA DIFFUSION BY FLIES

TO EDITOR, *Lancet*

SIR,—I have observed with much interest in recent issues of the *Lancet*, articles dealing with "Flies as Carriers of Disease." This is a subject which has engaged my attention for many years, and I would invite your attention to an article by me in the November issue of the *Indian Medical Gazette* for 1894, entitled "Flies and Cholera Diffusion."

The article is mainly a description of an outbreak of cholera in Gaya jail, of which I was then in charge, and the spread of which in the jail I attributed to, and proved to be due to flies. By an experiment the details of which were carried out for me by Mr Haffkine, who was then my guest, I was able to prove that flies carried the cholera bacillus into milk.

Since then the influence of flies as carriers of disease which was previously surmised has been accepted by all well known Indian Sanitarians, and rules based on that knowledge have been adopted by them.

I am,

Sir,

Yours faithfully,

R. MACRAE, M.B.,

COLONEL, I.M.S.,

Inspector General of Civil
Hospitals, Bengal

We direct attention to the above letter by Colonel R. Macrae, I.M.S., addressed to the *Lancet*, November 30th, 1907. We are very glad to see that Colonel Macrae has called the attention of medical men at home to the fact that the connection between flies and disease has long been known in India and that our measures of prevention of cholera, typhoid and dysentery are largely based on this knowledge.

The case referred to by Colonel Macrae and published in these columns in November 1894 (p 407), is a particularly good one, and for the benefit of a younger generation it may be well to very briefly recapitulate the main facts of this classical case.

The outbreak of cholera occurred among the prisoners of the jail at Gaya, where Colonel Macrae was then Civil Surgeon. There were 422 prisoners in the jail at the time. On the 8th July a prisoner was admitted and put in the ward for undetained prisoners, having been sent from Hazaribagh and having passed through many villages in Gaya district, where cholera prevailed at the time. This prisoner took ill

some eighteen hours after admission to jail, and before the illness was recognised he had passed a short time in three different portions of the jail, and unfortunately the Civil Hospital Assistant did not recognise the disease till the patient had passed several stools, which were not disinfected. The second case was in a prisoner on 12th July, who belonged to an outside gang, but lived in a barrack and yard very close to the undetained yard, where the first prisoner had spent part of the day and night. The third case was an overseer who slept in the same barrack, but not the same ward as the second case. The fourth case came from the same place as the third. The remaining cases, in all 34, came in at varying intervals from 9th to 20th July, six of them having occurred on 22nd July, and 11 within three days of each other. On 25th July 325 prisoners were moved out into Camp, and among them eight cases occurred, among the 87 prisoners left in the jail, eight cases also occurred.

Now as to the medium of the infection the water-supply can be excluded. It comes from a covered well pumped up, and though supplied to the female prisoners and to the jail officers, warders and their families, none of the latter were attacked. Milk is another vehicle, and it is notable that out of twenty-six cases in the jail twelve were getting milk as part of their diet. The milk was good, but contamination by flies could not be excluded, and flies were very numerous during these hot muggy damp days of July. On one occasion indeed during the epidemic Col Macrae found the milk kept in the (infected) hospital without a cover and full of flies.

Colonel Macrae then called in Mr Haffkine to make an experiment and he discovered that most characteristic forms of the comma bacillus could be recovered from milk experimentally exposed in the cowshed and in the latrines, where at this time flies were especially numerous.

We are of opinion that this is a very complete case, and that the flies were undoubtedly proved to be capable of conveying the virus from infected stools to milk exposed without a proper cover.

The next case to which we may very briefly refer is one reported by the present Editor (*Indian Medical Gazette*, March 1897, p 86), of a somewhat similar outbreak in the Burdwan jail. This case is as follows. In June 1896 a case of cholera occurred, quickly followed by several others, nine cases in all, four of which

were fatal. There had been cholera in several huts outside the north-east wall of the jail, and their stools were seen to have been spread about in the jungle close by, and to be covered with flies. On 4th June a strong north-east wind was blowing and it was noticed that myriads of flies were blown from the direction of the cholera infected huts into the jail and that these flies settled in large numbers on the prisoners' rice, etc., etc., spread out in the open. In this north-east corner of the jail, where the flies settled, one half of the prison population took their food and among these nine cases of cholera occurred. In the other half (females, sick and prisoners undertrial) separated from the rest and in separate walled enclosures no cases occurred. The water-supply was good and was the same for all. The milk was not infected as none of the gangs attacked by cholera got any milk, and those who got milk got no cholera.

These two cases illustrate the methods by which cholera can be carried by flies to the milk in one case and to the rice in another.

These cases have been mentioned by Dr Nuttall in his great monograph on insects and disease, but recent papers in the home press would seem to imply that this convection of disease by flies is a new discovery, whereas the above cases show that it has been long well known to men in India.

Current Topics

MALARIA : DRAINAGE IN CENTRAL BENGAL

THE Government Resolution on the Report of the Committee appointed to examine the extent to which the prevalence of malaria in the Presidency Division was due to obstruction of the natural drainage of the area by the silting up of rivers, etc. The Committee consisted of the Hon Mr Inghs, Chief Engineer, Capt Clemesha, I M S, and on his return from leave Lieutenant-Colonel Clarkson, I M S, the Sanitary Commissioner, assisted by Captain G E Stewart, I M S, and Lieutenant A H Proctor, I M S, as experts in bacteriology.

The first matter needing consideration was one we have oftened referred to and that is to what extent did malaria or "fever" in the statistical returns cover a multitude of other diseases. We have always maintained that serious though malaria is, yet its prevalence must not be judged by deaths ascribed by ignorant village headmen to malaria, and we are glad to see that the present committee are of opinion that only one-third of the cases ascribed to

malaria are really due to this disease. In other districts, Nadia and Murshidabad, it is probable that much of the deadliness attributed to malaria is really due to Leishman-Donovan infection, and we are sorry to see that this matter has not yet been settled.

We cannot expect anything very new as to the "causes" of the malaria, sanitation and the known water-logged condition of the soil are amply sufficient. We entirely approve of the suggestion to send itinerant hospital assistants to work through the fever areas in the malarial season and of course the usual measures of quinine distribution and commonsense mosquito prevention must be pushed. On the subject of drainage the committee have much to say. In the first place, the universal cultivation of rice needs great moisture and the ground built up of the alluvium of the delta is naturally lowlying.

The existing obstructions to drainage are of three classes (1) in the village sites, due to their notorious sanitation, (2) in the swamps (bhils) and rice fields, drainage of which is in many cases feasible, and in the rivers. Anyone who has ever seen the river Bhairab in Jessore will understand what the committee mean by a 'dead' river. This river has been filled up by a deposit of silt in the same way as the whole of deltaic Bengal has been built up and it is not possible to revive these dead rivers. Many impracticable schemes have been suggested by local authorities, but the committee wisely propose a concentration of energy on four schemes, viz, the Gobia Nala in Behulpur, the Bhairab at Jessore, the Bagjola and the Nawai Sooni schemes in the 24-Parganas.

We are entirely in accordance with the statement of the Committee as to the urgent need of further systematic and organized enquiry, and we are glad to see that their recommendations are likely to be carried out. The continued deputation of two I M S officers skilled in modern methods of research is also advocated and will be arranged for.

The report as far as it goes is satisfactory, and there is good reason to hope that the recommendation made, when carried out, will enable Government to do much to prevent the great prevalence of unhealthiness in these districts of Central Bengal.

THE MALAYAN ANTI OPIUM REMEDY

WE have been frequently asked for information with regard to the alleged anti-opium remedy which has been much discussed in the lay papers. We quote *in extenso* the following description of the plant and its method of use from a periodical entitled *The Journal of the Anti-Opium Association of Penang* —

The Malayan plant, which is said to possess such remarkable powers of staying the craving for opium, has been identified by the Government botanist at Singapore, Mr H N Ridley. It is known amongst the Malays as *akar gegumbang*, the word *akar* meaning

root, and *gegambai* being an abbreviation of *gam iei gambiei*. Its scientific name is "*Combretum sundajense*," species *Combretaceae*.

This creeper grows wild in the Malay Peninsula, and is found plentifully in low marshy districts and along the banks of streams, where in many cases it winds round other trees and attacks them.

The parent stem of the plant is between one and one and a half inches in diameter. The main characteristics of the stem, whether large or small are —

(1) it is hollow in the centre, (2) the bark or epidermis is fibrous, and (3) its branches always arise in pairs symmetrically in such a way that if one pair points north and south respectively, the next pair points east and west, the next again north and south, and so on.

The leaves are oval in shape varying from 1 to 2½ inches in breadth and from 2½ to 4 inches in length. These leaves also arise in symmetrical pairs after the manner of the branches. The ribs number usually 4 to 7, whilst the blade or flat part of the leaf is thin and non fragile. The fruit is quadrate, presenting the shape of Greek cross in transverse section, but the flower possesses no peculiar distinctions.

The medicine obtained from this plant is prepared and taken according to the Chinese method. The leaves, small twigs and larger stems are first separated. The twigs are divided into short portions of about one inch in length, and the larger stems cut into thin slices. These are next roasted separately in a large iron pan over a slowly burning fire, the process being improved by mixing the contents with some dry sand. After the leaves, etc., have been sufficiently roasted to a brownish-black appearance, they are removed to a cooling chamber and exposed to the atmosphere for 24 hours.

The decoction (called by the Chinese *Chung Heng Fok Sui*) is made by boiling a certain quantity of the roasted mass in a kerosine tinful of water until 40 per cent of the liquid has evaporated. The usual quantity employed is 35—45 taels of the roasted plant to every pikul (100 catties) of water, boiled down to 60 catties. The time required for this part of the manufacture is about four hours, after which the fire is put out and the liquid allowed to cool gradually.

The directions given for the taking of the anti-opium medicine have been modified considerably since it was first introduced four months ago. The following method has been found by experience to be the most satisfactory —

Divide one brandy bottle of the mixture (about 25 ounces) into two equal parts. To one part (A) add the usual weight of chandu dross (to be bought by the patient himself from the Opium Farm) consumed by him per day. A cloudy precipitate will be formed in this portion, due to the tannin present in the mixture coming in contact with the opium. To the other half of the decoction nothing is added. The patient is advised to begin with one ounce of A when the time for his opium pipe arrives, and then to fill A with one ounce from B, thus diluting the strength of the narcotic in A. Towards evening when the longing for smoke again comes, another dose from A is taken, and A further diluted as above from B. This process is repeated, and by the time the medicine is finished no chandu dross will have remained in the mixture. In some exceptional cases one bottle of the medicine is sufficient to cure the patient completely of the habit, but in the majority a second or even a third bottle is necessary with only half the daily consumption of dross added.

In addition to the medicine the patients are further advised to follow the subjoined directions closely —

- 1 Boil the medicine every day in the morning
- 2 Bathe regularly and be out in the open air as much as possible
- 3 Avoid the neighbourhood of the opium lounge
- 4 Consult the attending physicians whenever any discomfort arises, e.g., pains in the bones, weakness in legs, looseness of bowels, vomiting, etc

We cannot say that the above description of the remedy impresses us very favourably, and there is little evidence of any specific action of the plant *Combretum sundajense*.

RECORDS OF THE INDIAN MUSEUM

It is satisfactory to see the large share taken in the pages of the Records of the Indian Museum by medical men in India. In the first part (June 1907) there are papers on various natural history subjects from Captain R. E. Lloyd, I.M.S., and Dr. G. C. Chatterjee. In the August issue Major J. Stephenson I.M.S., has a note on an *Oligochaete* worm, Major F. Wall, I.M.S., and others publish reports on the Batrachia, Reptiles and Fishes of Nepal, and Captain H. J. Walton, I.M.S., has a note on the *Histoplasma lacustris*. In the October issue Captain Lloyd, I.M.S., has a useful and interesting report on the marketable fish of Akyab, and a note on phosphorescence in marine animals and Captain C. A. Goorlay, I.M.S., has a useful note on the rats of Eastern Bengal from which we learn that out of 1,041 rats identified 611 proved to be specimens of *M. rattus* and 430 to be *Nesokia bengalensis*. The comparative immunity of Eastern Bengal from plague, which, though often imported, has not become epidemic nor endemic, cannot therefore be explained by the absence of "plague-rats."

We have also received the two parts of Dr. W. C. Hossack's account of the rats of Calcutta. The first part we have already noticed, and here we need only call the attention of our readers to the eight beautiful plates illustrating Dr. Hossack's valuable report. This report and the accompanying plates should be in the hands of all men on plague duty.

YAWS : SYPHILIS

NEW LIGHT ON AN OLD QUESTION

THE third number of the new series of the *Annals of Tropical Medicine and Parasitology* (November 9th, 1907) has been received. It contains several very valuable and beautifully illustrated articles on parasitic protozoa and on the *spirochaeta duttoni* and the trypanosomes.

In this place we propose only to refer to the valuable article by Dr. G. S. Brady on yaws, in the West Indies.

Dr. Brady commences his article by showing the very great prevalence of syphilis in the West Indies, the tertiary form and especially infantile hereditary syphilis.

Dr. Brady's article shows that there is still much confusion as to the exact nature of the several ulcerations very common in the West Indies, in Fiji and other places. Many consider them to be yaws, others ascribe the nasal ulceration to lupus or to the destructive form of ulcerative rhinopharyngitis which we recently described (as found in the Philippines) under the name Gangosa.

Dr Brady calls special attention to the fact that these ulcerations often occur in young persons, and he is strongly of the opinion that these cases are tertiary syphilis and that cases of youthful acquired syphilis are much commoner than is usually supposed. "Coitus among children before puberty is as common as kissing among European children. The normal sexual life of the adult is one of transient concubinage." The writer is strongly of opinion that many ulceration cases in juveniles are tertiary manifestations of an hereditary syphilis, but secondary symptoms are "almost certainly due to the acquired disease."

This article is too long to quote, but it must be regarded as an admirable statement of the case for considering yaws as "the non-venereal (or sometimes venereal) syphilis of the tropics."

We may quote the following —

"My contention is that syphilis is very common, in fact, almost universal, among the natives of the tropics, that in certain districts it usually presents an eruption of papillomata, which has given rise to the idea of yaws as a distinct disease, but that the cases with papillomata present otherwise all the features of syphilis, just as do the non-venereal cases. To appreciate the relation of the various forms of eruptions to each other and to recognise their nature as well as to understand many other disease problems it is necessary to remember that *syphilis in the tropics is not usually a venereal disease*. Notwithstanding the vitality of long-rooted error, I feel sure that the profession would have more readily accepted the dictum of Jonathan Hutchinson had we realised the frequency of extra-genital chancre. It is the teaching of the schools, that syphilis is a venereal disease, which has blinded us to the fact that in the tropics it has little to do with sexual intercourse, that there is in fact far more non-venereal syphilis in the world than syphilis acquired on the genitals."

This is a very important statement, but we are not prepared to accept it in its entirety. Is it a fact "that syphilis in the tropics is not usually a venereal disease"? We do not think that such a thesis could be maintained in India for example. Syphilis is very common, as we all know, but such cutaneous manifestations as are called yaws and various vernacular names are by no means common or universal. What is called yaws is common as we know in Burma, in Assam and in Ceylon, but ordinary syphilis is common everywhere.

We cannot, however, but admit that Dr Brady's article is a valuable one, and has reopened this question in a new way, and we commend it to the attention of all our readers interested in this matter.

IS RABIES IN THE DOG ALWAYS FATAL?

It is generally believed that rabies in the dog is always a fatal disease, and it has been stated

that if a dog has bitten any person, and that dog does not die within some ten days, the disease it suffered from was not rabies and the person bitten was safe from any danger of rabies poisoning.

This is a very important practical point. We may, therefore, direct attention to an important paper by Dr P. Remlinger, of the Pasteur Institute of Constantinople, in the *Journal of Tropical Veterinary Science* (Vol. II, 4, 1907) in which he discusses this question. That experimental rabies has been followed by spontaneous recovery has been known for some time and Remlinger has demonstrated that such recovery does not prevent the persistence of the virus in the saliva of the recovered animal. It is even curable when the inoculation has been very severe, subdural or intraocular. Why then (asks Dr Remlinger) should clinical rabies not be curable? Rabies in the dog is a very protean disease. Remlinger also suggests that street dogs which sometimes show themselves refractory to experimental inoculation with rabies have possibly become immune after recovery from a previous attack.

The question has been raised, but it has not been proved, and we prefer to be guided at present by previous experience. As the author of the article quoted says—

"That street rabies sometimes recovers is quite possible, but not proven. It is certainly exceptional. We should not institute rules of conduct in regard to rabies based on rare exceptions. Twenty-five years of practice happily has taught us that in not sending persons bitten by dogs which survive to anti-rabic institutes we act wisely. Why modify a line of conduct which meets all interests?"

THE BENGAL VETERINARY REPORT

The following extract is of general interest —

"The Bengal Veterinary Bacteriological Laboratory — The laboratory has been recognized as the official establishment for the investigation and diagnosis of the diseases of animals in this Province. We have also been charged by the Chairman of the Corporation of Calcutta, and the Commissioner of Police, Calcutta, with the diagnosis of rabies. This is a wise step, for, apart from the desirability that a person bitten by a suspected dog should have his mind put at rest as soon as possible, it is obvious that to deal with rabid or suspected animals, whether dead or alive, a very dangerous business, not only to the person who does the work, but to others who assist, and to the public, if an animal be allowed to break loose. Therefore these investigations should never be carried out by any one, except an expert, in a suitable place.

Although the laboratory has been much handicapped by want of gas and apparatus until quite recently, we have done some work in connection with general diagnosis. Investigations have been carried out with regard to suspected tuberculosis in various places. I am glad to say that we failed to discover this disease in several suspected cases in jails, but the disease has been found in cows several times in the College Hospital. The number of cases of this description admitted yearly at Belgachia is sufficient to indicate that tuberculosis prevails in Calcutta, and as the British Tuberculosis Commission has just confirmed the opinion held by most people that tubercle is communicable to human beings by means of cow's milk, it is desirable that public attention

should be directed to the subject, though the disease is not nearly so prevalent amongst animals in Calcutta as in England. We shall always be glad to report free of charge upon any sample of milk or butter suspected to contain tubercle germs that is sent to our laboratory.

Surra or Trypanosomiasis, which is a disease caused by a blood parasite, has given rise to serious losses to horse owners. The parasite is harboured throughout the year by cattle, which apparently suffer, as a rule, so little from it that they show no external symptoms of its presence in their blood, nevertheless, the disease is carried from them to horses by biting insects, during the rains, and perhaps also during the hot weather. The death of a horse so bitten is only a matter of a few weeks. The disease is extremely difficult to diagnose in the early stages, unless the practitioner has considerable experience. This is very unfortunate, owing to the fact that the infection can be transferred from one animal to another from the beginning of infection. The Imperial Entomologist was good enough to depute, at my request, a fieldman to work in and round Calcutta during the rains, with the result that a collection of biting flies has been made, which include specimens of *Tabanus*, *Stomoxys*, *Lyperosia* and *Hippobosca*. This important work is to be continued during the approaching monsoon. Steps are also being taken to train some of the most promising veterinary graduates in collecting and preserving flies, etc., and collecting boxes will be distributed as soon as they reach me."

It is very satisfactory to see that the Bengal Veterinary College is rapidly developing and that the new Laboratory is well equipped. There are now 23 Veterinary hospitals and dispensaries in Bengal and more are certainly needed. Steady progress is being made in the inoculation of cattle against rinderpest.

SHIP BERI-BERI OR SCURVY

SOMETIME ago when commenting upon beri-beri, we hazarded the view that in our opinion much of what was called scurvy in the old days of sailing ships may well have been beri-beri. This strange and still mysterious disease has had special attention directed to it in Bengal by the occurrence of outbreaks diagnosed to be beri-beri among tea garden coolies in the Dajeeeling hills, in the Alipore Reformatory School, in the Victoria School at Kurseong, and in Howrah.

We have on previous occasions referred to outbreaks of beri-beri in ships cruising around Indian ports and in the lighthouses along the coast of Burma.

Our attention has been directed to the question again by two valuable experimental studies by Drs A. Holst and T. Flohich in the October issue of the *Journal of Hygiene*.

In Norway the medical authorities have been paying special attention to so-called ship beri-beri, the symptoms of which mainly are, weakness and dropsy of the lower limbs, shortness of breath and other symptoms of a weak heart, often causing sudden death. But the important fact remains that in these cases neuritis (usually considered an essential feature of beri-beri), was absent or very rare, being found by Nocht in cases in only four out of 57 ships' crews examined. This suggests the view that these cases

are in reality what we in India recognise as epidemic dropsy, a disease the separate existence of which is only doubted by those who have never seen it.

Dr Holst in the present article does not concern himself with what we may call tropical beri-beri, but only with the disease often called ship beri-beri or the "beri-beri of sailing ships," which he and Nocht considered to be "a food disease, showing a marked congruence with scurvy."

That this malady is a form of scurvy or related to it is shown by the fact that cases of dropsy without hæmorrhages or sore gums have been noted during epidemics of manifest scurvy. Such cases are quoted by Dr Holst from the history of the Crimean War from reports on French fishing fleets and from reports (in 1857) from various persons in Europe and North America.

Granting for the moment that the cause is essentially a dietetic one, it is not yet settled whether this is due to a deficiency of certain elements in the food, or to an intoxication by fermenting food or to an anti-intoxication.

Holst inclines to the view that the disease is due to a special form of underfeeding, that is, to a food containing "some but not all the necessary nutritive elements." It may be that the steam pressure used in preparing tinned foods destroys some of the nutritive elements of meat and fish, or it may only be that the continued use of tinned provisions causes a loathing, with the result that the diet becomes one-sided and consists chiefly of farinaceous constituents.

Drs Holst and Flohich draw the following conclusions from their experiments on guinea-pigs—

1 That a one-sided diet consisting of various sorts of grain, groats and bread, produces, in guinea-pigs, a disease which corresponds macroscopically as well as microscopically to human scurvy.

2 On the other hand, they have found that this disease does not occur after a one-sided diet consisting of fresh cabbage or fresh potatoes, whereas it is again produced by dried potatoes. That is, the disease originates in guinea-pigs as well as in man as a result of a diet confined to some special nutriment.

3 They have further observed that the disease is favourably influenced by different sorts of nutriment known, from human experience, as "antiscorbutics."

4 They have also quoted several examples showing that the same or similar one-sided diets that produce the disease in guinea-pigs have repeatedly produced scurvy in man.

5 So far they have not been able to produce ship beri-beri—"the younger brother of scurvy."

The report is interesting, and we hope this line of research will be continued.

From what we have heard of the recent outbreaks of dropsy and beri-beri in Bengal, we are of opinion that either there are two separate but

coincident epidemics, viz, one of beri-beri and one of epidemic dropsy, or (less likely) that both these diseases are stages of or rather types of the same disease

It is eminently desirable that all cases of "beri-beri" on ships, or on lighthouses should be carefully examined from the point of view of a scorbutic origin. We have heard the opinion freely stated by men who have seen the recent cases in the Darjeeling hills, that the disease is a form of scurvy. It is worth while at any rate examining these cases from that point of view.

In the very numerous reports and papers written about beri-beri the nature of, and method of preparing, the rice is constantly referred to, but we are not aware of any attention having been directed to the other nutritive elements in the dietary of the affected. Rice is the staple food of many of the classes affected by beri-beri, but it is not then only food. Rice is almost always eaten along with one or other of the pulses (*dals*), or with fish or meat. It is not impossible that the nitrogenous elements necessary to a sufficient dietary, supplied largely by the pulses or animal food, may be the reason why beri-beri or this form of scurvy like beri-beri is so rarely to be found in such well-managed institutions as the Jails in India.

KERNIG'S SIGN IN MENINGITIS

We quote the following extract from the *Ziet für Klin Medizin, Berlin* (p 192), on this useful sign, which we have always found to be reliable in cases of cerebrospinal fever —

"Kernig of St Petersburg first called attention in 1884 to the contraction of the knee as a sign of meningitis, he has examined thousands of patients with and without meningitis in respect to the occurrence of the sign. In his experience with 208 cases of acute meningitis the sign was unmistakable in 87 per cent and in 148 cases the clinical diagnosis was confirmed by autopsy. The sign was positive in 93.9 per cent of the 82 cases of epidemic cerebrospinal meningitis, and in 91.2 per cent of the 80 cases of the tuberculous variety. The severer the case, the earlier the sign appears. It sometimes vanishes after lumbar puncture, and does not always parallel the stiffness of the back of the neck. The appearance of the sign in other diseases is an indication of involvement of the meninges. In 390 cases of other diseases, typhoid fever, etc., the sign was pronounced in two, and autopsy revealed chronic leptomeningitis in one typhoid patient and spinal meningitis in a patient with lumbar spondylitis. Experience has confirmed the facts that the sign is less constant in children than in adults, that it vanishes when paralysis develops, and may reappear as the paralysis subsides, and finally, that it is positive in 90 per cent of cases of chronic leptomeningitis. The absence of the sign, he reiterates, does not exclude meningitis, but its presence in acute cases indicates that meningitis is extremely probable."

THE Government of India has circulated a memorandum of information for patients proceeding to Coonoor for anti-rabic treatment at the recently opened Pasteur Institute there

which is under the charge of Capt Cornwall, I.M.S. —

"Coonoor is situated on the Nilgiri hills about 6,000 feet above sea-level and can be reached by the Nilgiri Railway from Mettupalayam in about four hours.

2 Mettupalayam is on the south west branch of the Madras Railway and is easily accessible from all parts of Southern India. The institute is about a mile from the Coonoor Railway Station.

3 *Climate* — The temperature of Coonoor ranges between 60° F and 75° F from March to September and between 40° F and 60° F from October to February.

4 The rainfall is about 70 inches, the greater part being received during the north east monsoon in October, November and December.

5 Persons coming from the plains require fairly warm clothing and bedding, but nothing heavy. Indigent native patients will, as far as possible, be supplied with blankets.

6 *Accommodation* — There are several hotels and boarding houses which are open all the year round and also a residential club.

(a) Europeans and Eurasians are not accommodated at the institute, but must make their own arrangements for board and lodging about which there is no difficulty. Persons who cannot afford hotel rates can find inexpensive lodgings in the town within three-fourths of a mile of the institute.

(b) Well to do natives can find houses in convenient situations, and others can arrange for lodging and meals in the town. Indigent patients can be accommodated as far as there is room in the free quarters in the institute compound and will be provided with blankets and cooking pots.

(c) British soldiers stay in the station hospital at Wellington, and are sent daily to the institute in a tonga.

(d) Native soldiers will be accommodated in the Cantonment hospital, Wellington, and are sent daily to the institute in a tonga.

7 *Treatment* — Patients should proceed to Coonoor as soon as possible after being bitten, the probable date of arrival being intimated to the Director by telegraph. All treatment at the institute is free of charge, but patients who can afford to do so are expected to contribute something towards its upkeep. The course of treatment lasts from two to three weeks according to the severity of the case, and patients are not laid up, but can go about, as usual, having regard to the rules of life recommended. Patients should always endeavour to bring with them the brain of the animal that bit them, one half in pure glycerine and the other half in a mixture containing 3 per cent of bichromate of potash and 5 per cent glacial acetic acid in distilled water.

8 *Concessions* — The Madras Railway grants a return ticket from the patient's station to Coonoor for a single fare and the South Indian Railway grants free tickets on any way to indigent persons who produce a certificate signed by any of the officers authorised by Government to do so. In the case of children, women and infirm persons, who are unable to take care of themselves, these concessions are extended to one attendant.

The travelling expenses of indigent persons not in the public service belonging to the Madras Presidency and maintenance allowance both during the journey and while under treatment are paid from public funds, if neither they nor their relatives can afford the expense."

DR A SEIBERT, of the New York Polyclinic, writing in *The Journal A Med Assoc*, strongly advocated the disinfection of the nasopharynx with a solution of equal parts of resorcin and alcohol. The alcohol should be heated before the resorcin is added. The solution to be

applied on a plug of absorbent cotton wool, and the application repeated every 2 days. The treatment is very useful for all cases with a discharge of post-nasal mucus

It is curious that another small outbreak of plague should have occurred in November last in Glasgow, in the same locality as the previous outbreaks in 1900 and in 1901

WE desire to call attention to the courses of instruction provided by the Liverpool School for the Diploma in Tropical Medicine. Terms begin in January, May and October and examinations take place in March, July and December. The fee for the full course of instruction is ten guineas and the examination fee is five guineas. Full details can be obtained from the Dean of the Medical Faculty, University of Liverpool. So far 69 persons have received this diploma

WE have been seriously asked to explain how it is that while a rifle bullet finds difficulty in entering through the armour-like skin of a crocodile, it is possible for the *glossina palpalis* to so easily suck the blood of the big saurian. We confess not to understand this and we leave it to H. E. Prof Koch to explain. Possibly he does so, but so far we have only seen lay newspapers' accounts of the statement, and Prof Koch, like many others, has suffered severely at times from publicity in the lay press

KHAN BAHADUR DR N K CHOKSY, M.D. (Freiburg), is well known as an indefatigable investigator into the treatment of plague, and as head of the Arthur Road Hospital in Bombay he has acquired an enormous experience of this disease. We may, therefore, direct the attention of our readers to the two pamphlets recently published by Dr Choksy on the Serum Therapy of Plague where all that is to be said in favour of this method of treatment will be found. The numerous statistics from many sources show that there is a strong body of opinion in favour of this method of treatment

IN Dr Ashborton Thompson's report on the sixth outbreak of plague at Sydney (1906), there is an account of an attempt to destroy rats by Dr Danyez's virus, supervised by Danyez himself. The virus was brought by the discoverer and barts were prepared according to his instructions. It was found that the results were meagre, and it is obvious that the virus is of no great practical utility for rat destruction. When plague itself seems to have little effect in reducing the number of rats, it is scarcely likely that any other virus will have such effect. Never-

theless men of distinction in London have been prevailed upon to preach the value of this virus

A SECOND and thoroughly revised edition of Major Newman's well-known book on *Aseptic Surgery* is in the press. The first edition has been a great success, and the same may be confidently predicted for this eminently practical book, in which the requirements and environment of an Indian hospital is specially borne in mind

KOLOMEITSER (*Bulletin medic*) is responsible for the statement that the desire for smoking tobacco may be overcome by rinsing the mouth with a solution of silver nitrate (one quarter per cent strength)

CAPT T. DELANY, I.M.S., has been put on special duty to investigate the prevalence of so-called ber-ber or of epidemic dropsy in Eastern Bengal

Reviews

Studies in Laboratory Work—By C. W. DANIELS, M.B., and A. T. STANTON, M.D. Second Edition, Revised, December 1907. London: John Bale, Sons, and Danielson, Ltd.

THE student in tropical medicine has been well catered for during the past twelve months, first came the splendid volume (vol II, part II) on tropical diseases in the new edition of Allbutt's *System*, then followed the new revised editions of Sir P. Manson's *Tropical Diseases*. Next we have had Leonard Rogers' treatise on the *Fevers of the East*, and now before us lies a new enlarged and revised edition of the well-known work on tropical laboratory work by Dr Daniels, Director of the London School of Tropical Medicine, assisted by Dr A. T. Stanton, a Demonstrator in the same school.

The rapid advance in all branches of tropical medicine has rendered inevitable the continued production of such books. The great object of Dr Daniels' book remains as before, *viz*, the application of simple laboratory methods to the practice of medicine, and it aims at being of special assistance to the lonely worker in his improvised private laboratory, it may be in the corner of a verandah or in a converted dressing room in an upcountry bungalow. The first chapter is devoted to the description and furnishing of such a laboratory and will be found both practical and satisfactory. The next chapter on *post-mortem* examinations will appeal to many, the chapter on blood films staining and fixation is very useful. The fourth chapter takes up the subject of blood parasites and their detection,

and thoroughly describes the malarial and other parasites. The trypanosomes, the Leishman-Donovan bodies, microfilaria, filaria, etc., are well dealt with. The chapter on blood plasma and blood serum is excellent and describes Sir A. E. Wright's methods and also recent work on the precipitins. The following chapters give good accounts of insects, diptera, halteres, midges, mosquitoes, flies of many kinds, and especially the genus *Stomoxys*. That on mosquitoes, their larvæ, methods of breeding and collection is extremely practical and interesting. A very good account is given of the fleas, and this chapter and that on ticks are especially well illustrated. The chapter devoted to pigment deposits is novel and of importance, and a particularly good chapter is given to the examination of fæces. The section on the larger parasites and their ova and the methods of examination is well done. Other chapters are on urine, bacteria, bacteriology (media, plating, etc.), serum reactions, analysis of water, measurements of eggs, parasites, cells, etc.

In fact, the whole book is good and it can be confidently recommended as a full and reliable handbook for the laboratory in the tropics. We congratulate Dr. Daniels on its production.

An Index of Treatment—By ROBERT HUTCHINSON and H. STANSFIELD COLLIER. Bristol, 1907 (December). J. Wright & Co.

THIS is a book which will appeal to the busy practitioner, as it gives in compact well-written articles, a full account of the best methods of treatment of all diseases and diseased conditions. Those who know and have used Sir Wm Whitla's *Dictionary of Treatment* will welcome this new book which seems destined to take the place of the *Dictionary of the Belfast physician*. It is on the same lines and all the articles are arranged alphabetically, but in the new book the articles have been written by a large number of authors, each in their way a specialist in the subject treated. The co-operation of such a group of contributors (with well-known names like Allbutt, Rose Bradford, Bramwell, Harry Campbell, Clouston, Gow, Risien Russell, Mummery, Bannatyne, Eustace Smith, S. West) gives an authority to the book which is necessarily lacking in a book compiled by a single author.

We have read a lot of the articles and can confidently recommend the book as a useful one to Civil Surgeons and Medical Officers in India.

The Eye, Ear, Nose and Throat—Being Vol. III of the Practical Medicine Series. Edited by CASEY A. WOOD, M.D., ALBERT H. ANDREWS, M.D., and GUSTAVUS P. HEAD, M.D. Series 1907. Chicago. The Year Book Publishers. Agents in United Kingdom: G. Gillies & Co., Glasgow.

THIS is one of the practical medicine series, comprising ten volumes on the year's progress

in medicine and surgery, and is devoted to progress accomplished in the specialties named in the title. The editors' names are a guarantee of its accuracy and thoroughness, and a perusal of the volume shows it to be an accurate and comprehensive review of all that has happened during the year. It is a valuable work of reference and will prove useful to all practising these special branches of surgery. Reference to numerous original articles that have appeared during the year has proved that nearly all are mentioned and abstracts of them given. Major Smith's operation of removal of cataract in the capsule is referred to, but no reference is made to the discussion of its merits and drawbacks that has taken place in India. The *Indian Medical Gazette*, not being a special ophthalmic paper, has not yet been discovered apparently in America by ophthalmologists.

Preventable Blindness.—By N. BISHOP HARMAN, M.A., M.B., CANTAB., F.R.C.S. London: Baillière Tindall and Cox, 1907. Pp. 120, 8 illustrations, Demy 8vo. Price 2s. 6d.

THIS, in the author's words, is an account of the disease known as the ophthalmia of the new-born, and of its effects, with a plea for its suppression. This disease is preventable and is the cause of more than one third of the blindness found among school children. The importance of preventing it is great therefore, but is inadequately realised. As Mr. Harman points out, with the extension of the Employer's Liability Acts, it will be increasingly difficult for the physically defective to obtain employment, and the burden of maintaining such is likely to fall on the state. If only from pecuniary motives then an effort should be made to stamp out the disease. The book is an able attempt to bring this about, by giving within small compass a history of the disease, and a description of its incidence, clinical characters, bacteriology and treatment, ending with practical suggestions for its prevention. It should have a large circulation and be brought widely to the notice of legislators and pedagogues who could do so much to prevent the blindness it treats of.

Surgical Diagnosis—By DANIEL U. EISENDRATLE, A.B., M.D., adjunct Professor of Surgery in the Medical Department of the University of Illinois. Philadelphia and London: W. B. Saunders & Co., 1907. Pp. 776, with 482 original illustrations, fifteen of them in colours.

IN this large work the author has approached the question of surgical diagnosis mainly from the clinical standpoint. Diseases are treated as met with at the bedside, consequently many conditions not related pathologically are grouped together. This arrangement is similar to the one adopted by Dr. Harman in his popular text book on diseases of women and has many practical advantages. The book is profusely illustrated with original photographs of

cases and specimens, and must prove invaluable to hospital surgeons and house surgeons. All surgical affections are dealt with. The sections on surgical affections of the head and abdomen are the most complete and illuminating. The work ends with a useful chapter on methods of blood examination. As usual, the publishers have produced it in excellent style.

Kemp & Co.'s Prescribers' Pharmacopœia.—

A synopsis of the more recent remedies, official and unofficial, with a therapeutic index. Compiled and edited by A. PELL, FCS (Bombay Kemp & Co.) pp 600 Rs 5

THE sixth edition of Kemp's 'Prescribers' Pharmacopœia has just been published (price Rs 5) and we congratulate the Editor and Compiler, Mr A. Pell, FCS, the general manager of Kemp & Co., Ltd., on the excellence of the work. It has increased to 600 pages, the indexing being a special feature, and is now recognised as a standard work for India. In addition to an enormous increase of new remedies, including a large number of Indian drugs, we notice a long list of trade marks with their chemical equivalents which should be most valuable to both prescribers and dispensers. The Therapeutic index has been carefully revised and will be of great help to the memory of the busy practitioner. There have been added pages of selected formulæ, short notes of the hill stations in India, and a dose book at the end of the work which forms in itself a most handy manual of useful information and ready reference.

There are two features of great value in this edition to which we would call special attention. The first is an original paper from the pen of Lieutenant-Colonel Baumeister, RMS, Director, Bacteriological Laboratory, Bombay, on Anti-toxine Vaccines, and Organotherapy. The articles on anti-plague serum and vaccine should be of considerable interest as also that on Anti-Rabies Vaccines. The other paper by Dr. N. F. Sneyd, Professor of Bacteriology, Grant Medical College, Bombay, on Bacteriology will also be much appreciated.

SPECIAL ARTICLE

MOTOR VEHICLES FOR CIVIL SURGEONS *

By A NOVICE

MEDICAL men are one of the classes *par excellence* who have benefited by the coming of the motor car. It has been estimated that a reliable car will do the work of four horses at half the cost and in less than half the time. These

* The Society of Motor Manufacturers and Traders Ltd., Arundel Street, Strand, London, have recently established a Trade Information Department, which will put inquirers in the way of getting full information about intending purchases.—ED., I.M.G.

advantages can hardly be claimed for India, yet they are boon to medical men even out here. If their advantages were better known, they would without question be more frequently used, but many would-be motorists feel they are letting themselves in, for what they know not in the way of initial and recurring expense with very vague notions of the real services and drawbacks that they may encounter. Motor vehicles have by this time reached a high standard of reliability, but to ensure the full value being extracted from this fact, it is essential that they should be carefully kept and intelligently used. There are only two ways of ensuring this: either an expert motor mechanic must be employed and things left in his hands entirely, or the owner must learn all he can about his machine and trust it to no one else. The first course is costly, uninteresting and in many respects unsatisfactory, if a man can afford the expense it may still pay him well, but he is only a passenger and not a motorist. These lines are addressed to those who are prepared to adopt the second alternative.

A necessary qualification is some degree of mechanical aptitude or, at all events, mechanical interest. To those who feel themselves to be lacking in this respect, the only sound advice is "Don't." The joys of motoring are not for you yet awhile, not until indeed the facilities for repairs are much extended. But the man who feels he has the aptitude and is willing to make a hobby of it may in the course of a few months become a practical motorist who will not be dismayed by the prospect of being "hung up" on the road. The choice of a vehicle is largely governed by the depth of one's pocket, and taking the cheapest form first, we will begin with motor bicycles. The motor cycle has still a further advantage, *viz*, that the rider *must* be his own mechanic, and the apprenticeship served is invaluable in training the user to be a good "engine-man," and in thus enabling him to get the full value out of any higher powered vehicle he may subsequently become the owner of. Many a man who sits at the wheel of a car has the haziest notions of what is going on under the bonnet, and still more who have a pretty clear idea of the functions of each part of the mechanism, do not know how to adjust and manage them so as to extract the last ounce of work with a minimum expenditure of fuel and the consequent saving of wear and tear. A motor cycle too is a very useful second string even to a car owner when the inevitable day of adjustment and repairs comes round, or for short distances for which it is hardly worth while getting the car out.

Before going into details a brief description of the 2-cycle internal combustion engine as it is called may be given, for the benefit of those to whom it is still a sealed book.

The engine consists of a cast-iron cylinder bolted on to a crank case below. Inside the

cylinder is a close fitting hollow piston which is attached by a pivoted connecting rod to an eccentric crank pivoted on bearings in either side of the hollow crank case. Connected to or integral with the crankshaft is the heavy fly-wheel which, once set in motion, keeps up the rotary motion of the crankshaft, thus converting the sharp downward power stroke into a smooth and continuous rotary movement. At one end of the crankshaft a cogwheel is affixed which meshes with another having double the number of teeth, the second cog is therefore turning at half the speed of the engine and main crankshaft. Connected with the axle of the latter are an arrangement of variously shaped cams which actuate the valves placed in extensions in the side of the cylinder head, or combustion chamber. The extensions are called valve chambers or pockets. The electric timing apparatus (contact breaker) is also connected with the 2 to 1 gear wheel, of which more anon.

The cycle of operations is as follows—The piston descends causing a vacuum in the cylinder, at the same instant the inlet valve is opened and an explosive mixture of petrol vapour and air is sucked in. When the piston has reached the lowest limit of its downward stroke, this valve closes and *the suction stroke ends*. The up stroke of the piston then compresses the explosive charge in the now tightly closed cylinder, *the compression stroke*. On reaching the limit of its upward movement the now closely compressed explosive mixture is fired by the passage of an electric spark inside the cylinder, the rapid expansion of the burning gas drives the piston forcibly down before it, *the explosion or power stroke*. At the end of this stroke or in fact rather before the end of it, a second valve is automatically opened and held open, while the piston ascends pushing out before it the waste products of the explosion, this is known as the scavenging or *exhaust stroke*. The same cycle of operations is then continued. The sequence of events is thus—

Down stroke	Suction	Inlet valve open
Up stroke	Compression	Cylinder closed
Down stroke	Explosion	Spark passes cylinder still closed
Up stroke	Exhausting	Outlet or exhaust valve open

This description will make it clear why it is called the 2-cycle or 4-stroke internal combustion engine. The accessories necessary for its working are a supply of explosive gas, proper lubrication, a spark to fire the charge and some means of cooling the cylinder, which contains an intensely hot flame for exactly one quarter of the time it is working. *Cooling* is managed by the rush of air through the projecting flanges on the exterior of the cylinder in air-cooled engines, and by an enveloping water jacket, through which water circulates in the water-cooled engine.

The explosive mixture is provided by a device called the *carburetter*, which in a frequently

adopted pattern consists of two chambers. In the former of these the petrol running down by a pipe from the tank above, is kept at a constant level by the action of a float (the float chamber), on practically the same lines as an ever-ready inkpot. The mouth of the inkpot is represented by a projection in the centre of the second chamber with one or several minute apertures in its head. The lower end of this jet chamber is open to the air, which is sucked in by the engine and charged with petrol vapour as it passes over these orifices or jet.

Lubrication in its simplest form is provided by injecting thick oil into the crank case by means of a hand pump attached to the oil tank.

The rotary motion of the fly-wheel and crank throws it up on to the piston and cylinder walls.

The firing of the explosive charge of petrol and air is brought about by the passage of an electric spark of high voltage between the points of the spark plug at the psychological moment. The *spark plug* is merely a wire insulated in a sheath of thick porcelain packed into a cast-iron holder or jacket which is screwed into the cylinder. The primary current is supplied by a battery (accumulator or dry cell), which is connected with a Runkoff's coil. On the primary circuit is an arrangement for making and breaking this current, the contact breaker or *commutator*. The action of the coil is familiar and needs no explanation here, it will suffice to explain that the spark plug is set in the secondary circuit and is connected to the secondary winding of the coil by a heavily insulated wire, when the secondary induced current of high voltage passes on the break of the primary current, it jumps the gap between the points of the plug in the form of a hot spark.

Substitute for the battery a simple dynamo driven off the 2—1 shaft and retain the rest of the apparatus and you have one form of *high tension magneto ignition* as it is popularly called. (The Eisemann high tension magneto is an instance). Abolish the coil and substitute a specially constructed armature winding in the little dynamo, and you have a second form of high tension magneto (of which the Simms-Bosch is a typical example), which turns out a high tension current without the intervention of a coil. The third possible system is the *low tension magneto*, in which the current from a simple engine-driven dynamo passes through a special form of plug set in the combustion chamber and is broken in situ by an arrangement of spring-actuated rods on the engine itself. On the interruption of the metallic path the current jumps the temporary gap in the form of a flaming spark. It only remains to note that the contact breaker in high tension magnetos is an integral part of the dynamo, but whether it is on the dynamo or the side of the engine, there is provision for altering the actual moment of breaking the current and so of advancing or

retarding the passage of the spark in relation to the position of the piston in the cylinder.

The *motor-cycle* is simply an ordinary free-wheel bicycle strengthened and lengthened, in the frame of which is supported a simple form internal combustion air-cooled engine. The body contains the petrol and oil tanks, and a separate compartment for battery and coil ignition when fitted. The power is transmitted by a belt running over a pulley keyed to the rear side of the crankshaft of the engine in front, and over a rim or magnified pulley attached to the back or driving wheel behind. The pedals are usually retained for starting and helping the engine on steep inclines.

To start the engine, the petrol is turned on, the primary circuit closed with the switch, the exhaust valve lifted to overcome the compression of the engine and the machine pedalled or pushed off, the rear wheel temporarily drives the engine, and on dropping the exhaust valve, the process is reversed, the engine starts working and drives the back wheel.

It is easily stopped by switching off the current or raising the exhaust valve without removing the hands from the handle-bars. The secret of successful driving is to keep the spark advanced, the throttle closed as far as possible (i.e., the minimum supply of petrol vapour only given), and the extra air inlet opened as far as possible without stopping or slowing the engine down too much. The way not to drive, is to open your throttle, retard your spark and close your air. The result is overheating and unnecessary wear and tear all round. Regular lubrication is even more essential, the omission may result in the intensely heated cylinder and piston becoming welded together in one solid mass, or "the piston seizing" as it is called.

There are at least a dozen thoroughly good and reliable motor cycles of British manufacture available. The Triumph, Quadrant (now manufactured under three different names), the Vindex Special, Roc, Matchless, Phelon and Moore, and Brown to mention a few. The cost ranges from £35 to £50 for a new machine. The horsepower usually employed is $2\frac{3}{4}$ or $3\frac{1}{2}$. The former is quite powerful enough for the ordinary man who rides 12 stone or under, for a heavy weight the latter would be preferable. Pedals, a spring handle-bar and magneto ignition should all be specified, particularly the latter, and a back stand separate from the hind luggage carrier, and pivoted on the back stays and not on the back axle. Two good brakes both on the back wheel, one on the wheel itself, the other on the belt rim are very necessary. A complete set of tools and spanners should also be included, with complete spare valves and springs, bolts, nuts, etc.

Belt drive is usually employed and is smoother, more flexible and safer than a chain. For India, rubber and canvas belts are infinitely preferable to leather or hide ones which are

constantly stretching and require attention and shortening. A gear of 5-1 is generally useful, anything much higher is too fast for comfort. Such a machine will run from 10 to 30 miles an hour and go practically anywhere, as it only has a single track. When new and not mishandled, it should run 4 or 5,000 miles with but little attention.

To an absolute novice the best advice would be to get a second-hand machine preferably from a friend with magneto ignition, and learn on it and from it. The upkeep will be comparatively high at first, but the experience gained is worth the outlay. Later a good selection can be made and the old machine is very useful as a second string. The actual running expenses are small as a well-tuned-up bicycle should run 80 miles to a gallon of petrol, price Re 1-4 to Re 1-8 per gallon, with a few ounces of lubricating oil. Bicycle tyres are, as a rule, well up to their work and last for months, a small vulcanizer is a most useful spare, not only saving its cost in the prolonged life of tyres and tubes, but effecting pucca repairs, while patching is unreliable. When touring, two spare tubes should always be carried as well as patching materials, and non-endless tubes with a flanged rubber joint save an infinity of time and trouble as they can be slipped off and on without taking the wheel out.

A side car can be attached to any motor cycle, the extra cost is some £15. For light or station work a $3\frac{1}{2}$ h.p. cycle will do, but for touring with a side car occupied by a passenger, a two-cylindered machine of 5 to 6 h.p. is desirable. As a single mount it is rather cumbersome, but practice will overcome the disadvantages.

Reliable side cars amongst others are the Chater-Lea, Montgomery, and Mills-Fulford. For real comfort with a side car a 2-speed gear and free engine are desirable, 10-1 and 5-1 are suitable gears for Indian roads. Some machines, such as the Vindex Special, Phelon and Moore, and Roc have these gears as standard additions when asked for. But reliable gears amongst others, which can be fitted to any chain-driven machine without them, are the Phelon and Moore, and the Anghian. The total cost of such a machine with side car 2-speed gear and magneto should be easily covered by £75. The advantages of a side car over a bicycle are the greater stability it confers, and the large amount of baggage that can be carried, making the tourist quite independent for a single day's journey. Having only two tracks, it can run on all ordinary roads, and the castor wheel or compensating joints of the attachment throw little extra strain on the cycle. For those who intend always to ride on three wheels and never wish to use the bicycle alone, a chain drive is preferable to a belt. Other forms of passenger attachment, viz., the forecar or the trailer, are not so well suited for Indian roads as they run in 3 tracks and the jolting and strain on the machine is

great Trailers will probably soon be extinct unless they displace the rickshaw of hill stations

To those who are about to buy a motor cycle of any kind I would give one last piece of advice—order the *Motor Cycle* newspaper, not only does it contain a vast amount of information about their peculiarities, but the paper invites correspondence and gives practical advice to all in difficulties, and also get their little handbook on "Motor cycles and how to manage them"

Motor cycles with or without sidecars are excellent machines to learn on, handy and economical in use, but they have their limitations and a car will sooner or later loom largely on the mental horizon. Many may prefer one straight away without going through the preliminary apprenticeship and these remarks are particularly for them. I confess that I already feel myself in difficulties as I have seen but few ridden and fewer still driven, but having studied the subject from a prospective buyer's point of view, I may attempt a résumé of the opinions of others if not my own experiences, perhaps it may draw an expression of opinion from others better qualified to speak. The choice now lies between steam or petrol vehicles. The latter will only be considered at present, and first for the benefit of the uninitiated a brief account of the main outlines of the petrol car propelling and other mechanism may be attempted.

The simplest form of the 2-cycle internal combustion engine with one cylinder only was described above and the single-cylindered car-engine differs in no chief respect except in greater size and power. The 2-cylindered engine is merely a duplication of all parts excepting the crankshaft and case which of course remain single. These cylinders are usually vertical, they may be set at an angle of 90 degrees to one another known as the V engine, or they may be placed horizontally, opposite to one another and not side by side, as in the horizontally-opposed engine. The vertical position affords greater accessibility, the others are better balanced.

The sequence of events in working may be expressed thus - - explosions, explosion - - x x, as the pistons ascend and descend *alternately*. To produce a cycle, - x - \, the cylinders would be descending and ascending *together* and the balance would not be as good. The 3-cylindered engine once fairly generally built is gradually being discontinued, it is smooth in running and in some respects even better balanced than the 4-cylindered engine, which is the popular type now-a-days for moderately and many higher powered cars. With it there are 4 power stroke in every 2 revolutions of the engine shaft, as opposed to 2 in every alternate revolution in the 2-cylinder, and 1 in every alternate revolution in the single

cylinder. The order of firing is 1, 2, 4, 3, or 1, 3, 4, 2, as the central pistons ascend together while the outer ones are descending together.

Cooling is practically always accomplished on a car by water, which circulates through jackets enclosing the cylinders, thence through a system of fine pipes or tubes (the radiator) where it is cooled by contact with the air sucked past by a fan placed behind. The free circulation may be ensured either by a *force pump* driven off the engine, or in obedience to the natural law that hot water rises while cold sinks, the *thermosiphon system*.

The *ignition system* on a multiple cylindered engine is also a little more complicated by the introduction of an automatic switch or "commutator" which directs the current to each sparking plug in turn, by multiple wires.

It is when we come to the *power transmitting mechanism* that greater complications are introduced. In place of the simple belt or chain drive on the 1-speed motor cycle the following devices are introduced between the engine and the rear or driving wheels: the *clutch*, the *gear-box*, the *power transmitting mechanism* to the back axle, and lastly the *differential mechanism* on the back axle itself.

The *clutch* connects or disconnects the posterior mechanism to or from the engine crankshaft, it consists of a female portion or shallow drum, attached anteriorly to the crankshaft, and a male portion or cone which is pressed into the drum by powerful springs. The male portion may be a metal cone, plain or faced with leather or fibre, or it may consist of a number of thin steel plates pressed together and running in a bath of oil as in the Hele-Shaw clutch. The clutch always remains automatically in engagement by the action of springs, unless the male portion is withdrawn by the pressure of the foot on the clutch pedal.

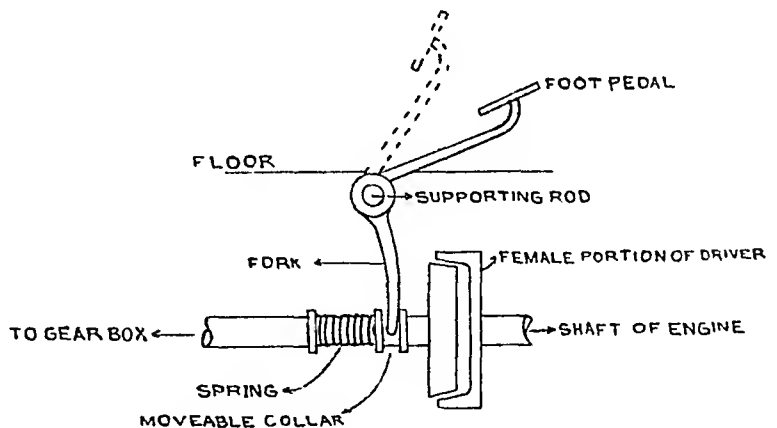


FIG 1—Diagram illustrating Clutch

The *gear box* is the piece of mechanism which provides for the variation of the speed of the driving wheels in relation to the speed of the engine. The sliding or "Panhard" type is the commonest. Briefly it consists of two parallel

shafts pivoted on bearings in the end walls of the box proper, with cog wheels of varying size on each. These shafts are known as the "main" and "lay" shafts respectively. The former is square in section and while the cog wheels on the lay shaft are revolving, the selected cog-wheel on the main shaft is slipped into mesh with one of them by means of a lever on the right hand side of the driver. On the lower gears the rotary motion of drive is thus transmitted from the clutch shaft to the lay shaft and thence back to the main shaft. But on the top speed, provision is usually made for locking the main shaft direct to end of the clutch shaft, thus transmitting the power without the intervention of the lay or secondary shaft. This is known as the "*direct or through drive on the top*". The ability to run backwards is also

tion, as none of the pinions or cogs in the gear box are in mesh.

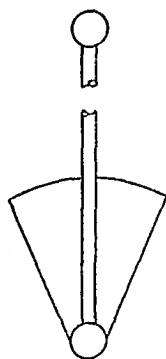
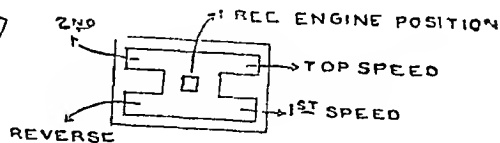


FIG 4—Side view of 'Gate' change
Neutral position



Plan of 'Gate' change

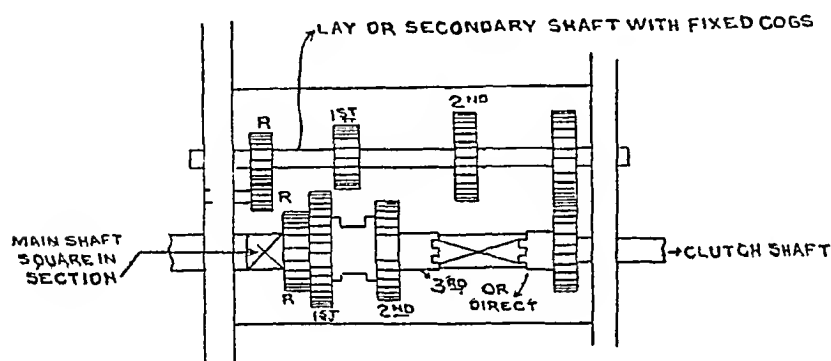


FIG 2—R—Reverse cogs. Free engine position
Diagram of sliding gear box

provided for by the interposition of a third cog between one cog on either shaft, the *reversing gear*. The change speed lever may work on a quadrant of *straight through change* or in

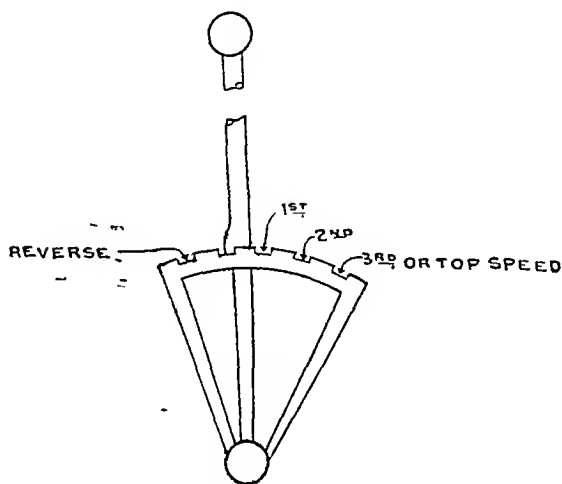


FIG 3—Side view of quadrant
Neutral or free engine position

what is called a *gate*,—the gate change lever. The latter which was only embodied on higher priced cars is now to be had on many of the lower priced 1908 models. With the lever in the central position no gear wheels are in mesh, this is called the *neutral or free engine posi-*

The drive from the gear box may be transmitted in several ways, the following are the three main types (1) by a single chain either direct to the back axle or by 2 chains with a countershaft interposed, this is only seen on low powered cars (2) by a short shaft to a countershaft parallel to the back axle and thence by 2 side chains running over sprockets on the ends of this shaft to larger ones fastened to the driving wheels themselves. This is known as *side chain drive* and as the rear wheels are usually pivoted on ball bearings on the ends of an axle which does not revolve, a common combination is *side chain drive with fixed back axle*. This form of drive

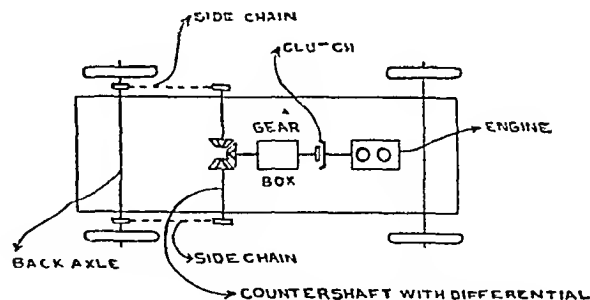


FIG 5—Diagram illustrating side chain drive

was common on most high powered cars, and many medium and lower powered cars, but in the 1908 patterns of the latter types it has almost universally been replaced by (3) the *cardan or propeller shaft*, also known as the *gear drive*. It is a solid shaft connected by means of an universal joint to the main shaft of the gear box, with a bevelled or cone-shaped cogwheel on its posterior end which meshes with another bevelled cog wheel on the back axle.

This is called the *cardan shaft and live axle drive*

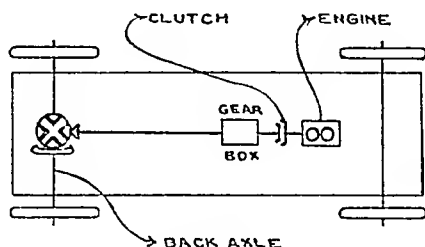


FIG 6—Diagram illustrating gear drive

The mechanism with which the posterior end of the propeller shaft meshes is known as the *“differential”*. It is a device which enables the rear wheels to revolve independently of one another at different speeds as when turning a corner. To this end the back axle is divided into two “half axles,” their opposing ends each carrying a bevelled cog which mesh with two more opposed bevelled cogs at right angles to them. These four cogs are supported or pivoted in the walls of spherical case, to the outer part of which the large bevelled cog or *crown bevel wheel* which meshes with the end of the propeller shaft is united. It is an ingenious piece of mechanism, and though there are various modifications, the principle is the same in all. It is a very necessary piece of machinery and one which has been brought to a high pitch of perfection, but must be taken with the car on trust, and nothing more need be said about it here.

Vital parts of a car’s mechanism are the *brakes and the steering gear*. The former include a pair of brakes acting on drums on the back wheels usually actuated by a hand lever on the driver’s right, and a single brake acting on a drum on the driving shaft which slows the car through the power transmitting mechanism and is usually actuated by a foot pedal.

The *steering* is practically always by a wheel connected to a shaft with a deeply cut spiral at its lower end. A notched quadrant meshes in this spiral and is connected to a rod running to a projecting arm from the axle holder of the off hand wheel, the two wheels are further connected by a rod pivoted on an arm from the holders of either front wheel. The wheels thus turn together and preserve their parallel positions. The position of the steering rod may vary, sometimes it is placed behind the front axle, a position which has the merit of safety in the event of a collision with any object sufficient to damage the rod, as the front axle bears the brunt and saves it from harm, sometimes it is placed in front as being the mechanically more correct position where it works always in tension. No rotation of the steering wheel is possible by a deflection of the road wheels, of in other words the steering is irreversible.

The *control of the engine* itself is exercised by the movement of the ignition and throttle levers. In most modern cars these are placed on the top of the steering wheel where they can be moved without removing the hands from the

wheel. The function of the former is to advance or retard the timing of the spark, of the latter to open or close the valve admitting petrol vapour from the carburettor. In addition an inlet lever is sometimes fitted, an extra which can be added at small expense if desired. It too should be placed on the top of the wheel. All kinds of interconnection between the movements of these levers and those of the clutch and foot pedal brakes are possible. Thus opening the throttle may also advance the spark, and depressing the clutch pedal may also close the throttle, while applying the foot brake may withdraw the clutch at the same time. These interconnected functions render a car much simpler to drive as there is less to think about, but make it more complicated to keep then correlated adjustment in perfect order.

This brief description of the standard features of the mechanism of a car is not very enlightening but may stimulate curiosity, and a study of “The Motor Manual” or “The Autocar Handbook,” published by Iliffe & Sons will well repay anyone anxious to learn more.

The *essential constructional requirements* in a car for successful use in India are (1) a thoroughly efficient *water-cooling system* and *magneto ignition*. Many otherwise reliable cars are given to overheating in the hot weather, because the volume of water available for cooling is insufficient, or because the radiator is too small for the purpose. If the radiator is the *only* water tank, these objections are, of course, synonymous, but sometimes with the pump system a water tank is fitted in addition to the radiator. Water circulation may, as we have seen, be effected by a pump driven off the engine or by natural circulation in the thermo-syphon system. The objections to the former are that there is extra work for the engine to do, and extra mechanism to go wrong. The only objection to the latter is the manufacturer’s one, *viz.*, that the engine has to be specially designed. Cars are at present in a transition stage, and the thermo-syphon system will probably prove the survivor. It would not be practical to reject a car on this point only, and you have therefore to take what you can get, but whatever the system available, *the radiator must be of ample capacity*. A superficial area of three square feet on a moderately powered car might seem a counsel of perfection, but would probably prove thoroughly satisfactory in practice. If the makers offer the choice of a specially large radiator, as many do in their colonial models, it should always be incorporated and is well worth the extra cost. Honeycomb radiators, when not internally encrusted with calcareous deposit, are probably more efficient than gilled tubes, but the latter are stronger, while the former have a troublesome way of developing leaks, difficult to locate and still more difficult to repair. Preference should, therefore, be given to the latter, but the tubes should be vertical.

(To be continued)

Correspondence

MALARIAL PNEUMONIA

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—Having read Capt J Hay Burgess's article, in the *Indian Medical Gazette* for April 1907 on "Malarial Pneumonia," I would like to add my testimony to his opinion that there is such a thing as Malarial Pneumonia. I have seen several cases very like what he describes. I regret that being on leave I have not got any notes of these cases, so cannot describe them fully.

His treatment of these cases with quinine has been of special interest to me. Several years ago it struck me that cases admitted at first asague which developed pneumonia afterwards, always did well when the quinine was continued during the Pneumonia. Reading Burney Yeo's Manual of Medical Treatment regarding the Treatment of Pneumonia I found the following (page 608 Vol I, 1902 edition) "We have, ourselves, been led to the conclusion that quinine frequently exercises a beneficial influence over the course of acute pneumonias of the class we are considering (acute Lobar pneumonia)." We do not look upon this drug merely as a depressor of temperature, as some appear to do, but we regard this effect as incidental to some direct action on the infective morbid agent or on its activities. We have been led to conclude, from facts observed, that quinine is in some degree an antitoxin to the toxins of many infective germs, in what precise manner it is impossible to say—

We have always given it in a special manner which we believe greatly influences its favourable action. We give from 1 to 3 grains every two to four hours according to the age of the patient and the apparent severity of the attack, and we give it dissolved in citric acid and then added to an alkaline mixture, so that it is really taken in an effervescing saline draught."

Burney Yeo then gives the prescription which he always uses and notes on cases he has found do well with the quinine treatment. He then says "We have brought the use of quinine in pneumonia under the first indication" to endeavour, if possible, to *antagonise the injurious influences of the specific infective organism on the blood and the tissues*.

"Finally, we may remark that all physicians are agreed that quinine must be given freely in those forms of pneumonia which arise in association with exposure to malarial influences."

Having read this I decided to give it a thorough trial in all cases of pneumonia. I have used this treatment now for three years in the Regimental Hospitals of the 32nd and 37th Lancers and the Civil Hospital, Loralai. The results have convinced me that it is an excellent treatment and I only regret I am unable at the moment to give statistics of cases.

My treatment of all pneumonias is poultices over the affected area of the lung, careful attention to keeping the bowels open, and effervescing quinine mixture as described by Burney Yeo (3 grains of quinine every three hours). I give no stimulants, and only milk diet. Speaking from memory, I should think, I have tried this treatment in 100 cases or more, so that I am not lauding a treatment that has not been fairly well tried.

Yours, etc ,

J FERGUS PATERSON,
CAPTAIN, I M S ,
37th Lancers

VIPERINE SNAKE POISONING

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—The case of snake poisoning, described by Lieutenant G G Hirst in the April number of the *Indian Medical Gazette*, reminds me greatly of a case of snake poisoning I had under my care in Fort Sandeman in August 1905. In my case there were severe hemorrhages from the nose, gums and seat of wound. There was hematuria and melena. The patient was going from bad to worse in spite of treatment with Calcium Chloride, Ergotine and other Styptics. Suddenly it occurred to me to try Adrenaline, which I did, with most beneficial results. I think this treatment is well worth trial, and I shall certainly try it in the next case of Viperine poisoning I have under my care. From the description of the snake which I did not see it was probably a V Russellii.

Yours, etc ,

J FERGUS PATERSON,
CAPTAIN, I M S ,
37th Lancers

A CASE OF GONORRHOEAL SEPTICÆMIA

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—The following case is worthy of publication—A dooly-bearer was admitted to hospital on the 11th November suffering from synovitis of the left knee, which from its appearance and the history of a recent discharge from the mother was diagnosed as of gonorrhoeal origin.

Oidiiury treatment was adopted, and the man's general health did not seem impaired until the 4th December, when he complained of some swelling of the glands on the right side of the neck, the cause of this swelling could not be accounted for.

On the 5th December the man's general condition did not seem so good, the glands were more swollen and those on the left side were beginning to swell, there was no fever but the pulse was rapid. On the 6th both sides had become very swollen and the man was obviously seriously ill from some toxæmia, both pyæmia and gonorrhoeal septicæmia were thought of, but as the man had been three weeks in hospital and there was no plague in the district, the former diagnosis seemed difficult.

On the 7th, the man was in a dying condition and the glands were still more swollen, a hypodermic drew off a drop of turbid serum from the glands, this was kindly examined by Lieut Whitmore, I M S who reported that it contained a pure culture of gonococci, the man died during the day and more smears from the glands were taken and the above diagnosis confirmed, in no film could a single organism be found showing any connection between the cocci of which the shape and distribution were typical. Unfortunately I had no tube to inoculate.

The patient was free from fever the whole time, nor were there any symptoms pointing to cardiac affection nor to other metastases.

Yours, etc ,

C BROADBENT,
B S, LOND ,

Jhansi Cantonment Hospital

Service Notes

I M S DINNER IN CALCUTTA

ONE of the most successful I M S Dinners ever held came off on the evening of Friday, 10th January, in Calcutta at Peliti's.

Surgeon General Bomford was in the chair and Colonel R Macrae sat opposite him.

The following were present—

Surgeon General Bomford
Colonel R Macrae
Lieutenant-Colonel T Grainger
Lieutenant Colonel C P Lukis
Lieutenant Colonel E F H Dobson
Lieutenant Colonel D G Crawford
Lieutenant-Colonel F J Drury
Lieutenant-Colonel H Pilgrim
Lieutenant Colonel C R M Gicen
Lieutenant Colonel F C Clarkson
Lieutenant Colonel J G Jordan
Lieutenant Colonel F P Maynard
Lieutenant-Colonel A H Nott
Lieutenant Colonel W J Buchanan
Major H F Cleveland
Major F O'Kineally
Major R Bird
Major R H Maddox
Major C R Stevens
Major Leonard Rogers
Major A Gwyther
Major J A Black
Major R Wilson
Major V E Lindesay
Captain J G P Murray
Captain J C H Leicester
Captain G King
Captain W C H Forster
Captain D McCay
Captain M Thorneley
Captain M Mackelvie
Captain F P Connor
Captain Lloyd
Captain Emslie Smith
Captain V B Nesteld
Captain D White
Captain W Gillitt
Lieutenant W A Mcarns

The first toast of the evening was of course—The King. Surgeon General Bomford then rose again to propose "the prosperity of the Indian Medical Service." He began by proposing an unanimous vote of thanks, first of all to Capt F. Power Cannon and Capt Murray, "the organisers of the feast," to whose exertions the dinner was due.

He reminded his audience that in 1901, when the last I M S Dinner was held in Calcutta, it was proposed to make it an annual event, and this so far has only turned out to be an enthusiasts dream, but he thought that the old custom of an Annual Calcutta Dinner should certainly be revived (hear, hear). Bombay, Madras and Lucknow and notably Simla had their dinners annually, and certainly Calcutta should also have one. He wished to say one word for the annual Simla Dinner, he was specially told to say this, he wanted more men from Calcutta, Madras or Bombay to come to the Simla dinner. The Simla dinner could not depend on the few local men, and relied on "the ten day leave men," but Simla wanted more men, "of the Harley Street type" from Calcutta and elsewhere. He thought that Colonel Macrae and other I Gs might help them and arrange for leave to attend the dinner at Simla, "without encroaching on their hard earned ten days' casual leave." He was not pretending what he never pretended. When I G in the Punjab, he gave all the men leave to Simla for the dinner and even arranged that the Railway Company give concessions for the journey, which however he thought might not be so easy to arrange here and of course (he went on to say) such a concession was less necessary for the "Calcutta plutocrats." On one occasion so many attended a Simla dinner that a patient complained "that he could not find a Civil Surgeon from Peshawar to Ambala."

There was, however, another matter besides recommending the dinner at Simla which he had to say something about. This was a proposal for a Medical Congress, or rather a Congress of the Medical Services, who, he proposed should meet, preferably in some Presidency Town (and where better than in Calcutta?), where there are good and large medical institutions. Men of the I M S and of the R A M C might meet together to compare experiences and opinions, with the resolution to emulate each other's zeal and capacity. It must be held in one of the Presidency Towns, in a centre of professional attraction. This Congress proposal he said, had been, strange to say, "forced on him by the ophthalmologists," "men of belligerent aims," and he thought it a good opportunity for "a harmless escape of aqueous humour" not vitreous as some one suggested that was a liability.

The Director General concluded his speech by asking his hearers to remember his two points, namely more support for the annual Simla Dinner and the proposal for a Congress of the Medical Services, and then gave the toast of "Prosperity to the I M S." The speech was an excellent one, full of humour, and was enthusiastically received.

Colonel R. Macrae soon after rose to propose a vote of thanks to Surgeon General Bomford. He said that during the former speech he had thought of many beautiful things to say, but he thought no words of his were necessary, Surgeon General Bomford was well known in Calcutta, who for long he had been the leader of the profession, and now in his more exalted sphere he knew that they all agreed that the honour and interests of the Service were safe in his hands. This toast was enthusiastically drunk and after a reply from the Director General, the piano was brought in, and the following officers contributed to the success of the evening by then singing, viz Major C. R. Stevens, Lieutenant Colonel Lloyd Jones, Major Hayward, Major O'Kinealy, Major V. E. Lindsey and Captain Emslie Smith (on his 'cello).

The dinner was an entire success and the universal wish was that the meeting should be an annual one.

MAJOR W. B. TURNBULL, I M S

We have already referred to the sad and untimely death of Major W. B. Turnbull I M S, late Civil Surgeon of Manipal, U P. This is the third I M S Officer during 1907 to lose his life by blood poisoning contracted during the performance of his surgical duties.

By the courtesy of the Hon'ble Colonel R. D. Murray, I M S, we are enabled to give the following account of the accident. The report is given by the District Judge of Manipal.

"Whilst clearing his hands after a post mortem Major Turnbull noticed that an abrasion was raw. His special study was the blood and its diseases, and he realised at once that he had become infected with pyæmia. Nevertheless, he continued his duties till evening of the third day, by which time high fever and other symptoms had set in. Throughout his illness he was quite complaining, and in his conscious moments cheerful, and solicitous only for the comfort of those who attended him.

Manipal will long remember his courage and devotion during the plague epidemic and his attention and gentleness to

the poorest patients both in hospital and at their homes. The Civil Hospital has been considerably improved by him and the Jail kept in excellent condition. His professional ability was of the highest rank and his regular attention to his duties cannot be surpassed. The Government has lost a faithful servant and the public a devoted friend."

The District Magistrate adds that "it was due to a strict devotion to duty that Major Turnbull died." Major Turnbull took the degrees of M B and C M at Edinburgh in 1893. He entered the service with commission, dated July 1895. He was Medical Officer, 86th Sikhs before he came to Civil employ. He served on the Tibet Expedition. Major Turnbull returned from leave in November 1906, bringing with him a young wife who died of dysentery in a few short months.

In the New Year's Honours List the following honours to medical men appeared—

Major J. N. Macleod, M B, I M S, Civil Surgeon of Quetta, was made a C I E.

Lt Colonel R. C. MacWatt, M B, I M S, Agency Surgeon received the Kaiser-i-Hind Medal of the first class for "public service in India."

Moulvi Daudu Rahiman, 1st Grade Assistant Surgeon, Bengal was made a Khan Bahadur. Senior Hospital Assistant Kelai Singh of Gilgit is given the title of Sirdar Sahib, Senior Grade Hospital Assistant Abdul Majid Khan, Burma, is made a Khan Sahib, Senior Hospital Assistant Nibaran Chandra Sen of Dujeeing, and Assistant Surgeon Gauri P. Raha, of United Provinces, are made Rai Sahibs, and Assistant Surgeon V. N. Rege, of Bombay, is made a Rai Sahib.

Mr. Q. Grant, M D, Revd T. V. Campbell, M B, Nursing Sister Moore and N. P. Kantzow got the Kaiser-i-Hind Silver Medal.

RUIRS for the admission of Commissioned Officers for employment in the Assay Department are published (G. of I. Resolution No. 7226 Ex., dated 2nd December) in the *Gazette of India* for December 7, 1907.

As a general rule only Commissioned Officers shall be appointed substantively to the Assay Department (that is, I M S Officers as well as R E Officers or Indian Army Officers). A course of training in England is prescribed viz, 44 months' course of inorganic chemistry at the London Royal College of Science, with a practical course of analysis, 4 months' course on Metallurgy and methods of assay, and one month's course at the Royal Mint. There will be an examination after each course. The minimum pay is Rs. 450 per month.

If an officer sees a good chance of getting a permanent appointment as Assay Master in reasonable time, there are many advantages in these appointments. They necessitate life in either Calcutta or Bombay, which, though expensive, is not without advantages.

THE retirement of Lieutenant Colonel A. W. Alcock, C I E, M B, F R S, LL D, is gazetted with effect from 29th December 1907.

In the retirement of Lieutenant Colonel Alcock, the Indian Medical Service loses one of its most distinguished men. Educated at Aberdeen, he was out in India for some time as a schoolmaster, he then took the degrees of M B and C M in 1885, and soon after entered the service. His strong bent for natural history led to his taking the appointment of Surgeon Naturalist to the Royal Indian Marine Survey, where he did many voyages and made many researches published in the proceedings of many scientific societies, and embodied in a most charming book for popular use published a few years ago.

In 1895 he was appointed Naturalist and proceeded with the Punjab Boundary Commission. Soon after he was appointed Superintendent of the great Indian Museum at Calcutta and did much to make the reputation of that institution, which, as is known, contains collections of natural history subjects which have few equals in the Museums of other countries. It was often said of Colonel Alcock that he had a far greater reputation in Germany and on the Continent of Europe than he had in India. His work was known to and quoted by all the learned bodies of Europe and on more than one occasion specimens and collections made by investigators in other countries were entrusted to him for description and editing. That his work was well known in the British Isles is evident from the conferring on him in 1901 of the degree of LL. D. by his own University of Aberdeen and by his election as F R S. Nor was the Government of India ignorant of his reputation, for they made him a C I E.

It is much to be regretted that circumstances arose which made him unwilling to continue longer to direct the destinies of the Indian Museum. He took leave a couple of years ago and has now retired. We are glad to learn that he has been appointed Lecturer on Zoology to the London School of Tropi-

cal Medicino and we wish him long life and prosperity in his new career.

A MEETING was held on 27th November 1907, of the Irish Medical Schools and Graduates Association in London, and to quote the *Lancet*—

'The chief feature of the evening was the presentation of the Arnott memorial medal to Lieutenant Colonel Sir Haylock H R Charles K.C.V.O., C.B., I.M.S. The Arnott medal was founded in 1900 by Mr. David Arnott in memory of the late Sir John Arnott and is awarded annually for some deed of heroism or distinguished service or for some act performed in discharge of medical duties in civil life. The medal was awarded to Lieutenant Colonel Sir Haylock Charles for the introduction of improvements in the surgical treatment of diseases in India.'

WE regret to announce the death of Assistant Surgeon (retired) Baidin Chander Chaudhri, who was probably the oldest medical man in India. He was one of the original students who entered the Calcutta Medical College, on its foundation in 1835, but was not one of the first four who qualified in 1838, having withdrawn from the examination. He passed the following year. In 1842 he was appointed Assistant Surgeon, or rather Sub Asst Surgeon, as the title then was, to the Imambara Hospital, Hughli, which had been established in August 1836 by then Civil Surgeon of Hughli, Thomas Wise. The Civil Surgeon used to draw a monthly allowance of Rs 100, as Superintendent of the Hospital, up to 1842 when Baidin Chander Chaudhri was appointed as Sub Assistant Surgeon, and the allowance paid to him. He remained in charge of the Imambara Hospital, occasionally acting for short periods as Civil Surgeon, up to his retirement in 1857. He lived in Hughli for another half century and died there at the patriarchal age of 97, on 18th August 1907. At one time he had a very large practice which he gradually dropped with advancing age. He is said to have left about twenty lakhs. This huge fortune it is hardly necessary to say was not accumulated through the practice of his profession. The foundations of it were laid in that way, but the bulk of it was piled up by judicious speculation in land and mortgages.

WE quote the following paragraphs from the *Pioneer* (17th November) on the subject of fees charged by Civil Surgeons on which a rather vigorous correspondence had recently taken place—

"The style of argument adopted by a correspondent elsewhere who, professing to write in the public interest on the medical fees question, delivers a spirited assault on the morals and competence of the Medical Service in general, hardly appears likely to advance matters. When the point at issue is whether the Government are well advised or perversely fussy in interposing between the I.M.S. officer and his private Native patients, stories of how a certain Civil Surgeon once failed to attend a missionary's baby, and the like, do not seem to contribute to the issue at a just conclusion. Isolated cases, or anecdotes of inefficiency, unprofessional behaviour, extortionate charges, and what not, could be easily scraped together against any service or profession. But what do they amount to? Our correspondent speaks of the medical fossils who might be dug out of the smaller stations, and it is quite possible that a diligent search in these places might bring to light some rare specimens. But do the other official strata of India furnish no instances of the fossil? On the whole the Medical Service may well claim to have stood well in advance of the average of professional efficiency throughout the course of Anglo-Indian chronicles. Sixty years ago when the smaller stations were full of fossils of the Civilian species, when fossil Chaplains were no rarity, and the Indian army positively swarmed with petrified field officers, the medical officers as a body were preserved from stagnation by the incentive of keeping up in some degree with the scientific progress of their profession. There is before us the confidential inspection report of the 38th Regiment of Bengal Infantry then on active service in 1840—that dismal era when military competence in the Indian army had fallen to the lowest ebb—in which we find the following entry:

'Q. Whether the medical officer is zealous and regular in his attention to the sick?

A. Yes, very zealous and attentive to his duties. The only man belonging to the regiment who is very attentive and competent to the discharge of his duties.

"It may be said that this reminiscence travels as far from the point and proves as little as the stories of 'PRO BONO PUBLICO'. If so, it must be pleaded that a bad example is always catching. But our correspondent seems to raise a question more to the purpose when he asks why medical officers should be allowed different treatment from other servants of Government in being permitted to undertake private work at all. The answer presumably would be

because it is good for the public, good for the Government, and good for the service that they should do such work. Originally the Surgeon like the Chaplain was imported for the sake of the official community. When a non official community grew up by the side of the first, it would have been as bad to deny them the services of the doctor as to exclude them from the offices of the Church. But the doctor was naturally remunerated for these outside private services, and as the non official element grew, the fees in large stations came to be a recognised addition to the attractions of the service. With extended practice came increased experience, which in medicine and surgery is the only road to eminence. To abolish private practice now would be to inflict a desperate blow upon the whole non official European community in the mofussil, to lower the attractions of service, making it necessary for Government to put up with inferior recruits or pay much higher, and to reduce all Civil Surgeons to the condition of the small ones, to the rapid multiplication of the fossils, of whom our correspondent complains. But he himself admits that the system, unjust as it is to other professions, has been in existence so long that it would be scarcely possible to make any alteration at present. As for the other Government services who are supposed to be chafing at the opportunities allowed to the doctors it is not easy to see how a Civilian or an Army officer should utilise his professional services in private employment. But in the case of the Law which approximates most nearly to Medicine, the principle of private practice is fully admitted. If the State had to maintain a corps of whole time Government Advocates and Public Prosecutors all over the country, it would either have to pay a prohibitive sum, or put up with very indifferent agents, who, by reason of their limited practice, would perform the business falling upon them worse than they actually do perform it."

ON return from combined leave Major G. McI. C. Smith, I.M.S., is posted to Kairat, and assumed charge of his duties as Officiating Civil Surgeon on the forenoon of the 28th of October 1907, relieving Assistant Surgeon Maya Das.

HIS Excellency the Governor of Bombay in Council is pleased to make the following appointments—

Captain W. H. Cazaly, B.A., M.B., B.S. (Lond.), I.M.S., on relief by Captain F. H. G. Hutchinson, M.B., I.M.S., to act as Deputy Sanitary Commissioner for the Central Registration District.

Captain K. V. Kukday, I.M.S., on relief by Captain J. L. Majorbanks, M.D., B.P.H., I.M.S. to act as Deputy Sanitary Commissioner, Gujarat Registration District.

Captain W. O'S. Murphy, M.B., I.M.S., on relief, to be substantive *pro tem* Deputy Sanitary Commissioner for the Sind Registration District.

MAJOR W. S. P. RICKETTS, M.B., I.M.S., is appointed Deputy Sanitary Commissioner, Sind, *vice* Lieutenant Colonel A. V. Anderson, I.M.S., retired.

DURING the leave of Major J. G. Hojel, M.B., I.M.S., Major J. H. McDonald, M.B., I.M.S., acted as Surgeon to the G. T. N. General Hospital, Bombay.

LIEUTENANT COLONEL W. H. E. WOODWRIGHTS, F.R.C.S. I.M.S. Civil Surgeon of Aligarh, acted in visiting charge of Bulandshahr during the absence of Capt. H. J. Walton, F.R.C.S., I.M.S.

ON return from leave Major W. Young, I.M.S., is posted as Civil Surgeon to Budann, and Major E. J. Morgan, I.M.S., to Etawah.

ON leaving Mussoorie Lieutenant Colonel Pisani, F.R.C.S., I.M.S., is posted to Moradabad, and Lieutenant Colonel J. M. Cadell, I.M.S., goes to Jaunpur.

THE following transfers and postings are ordered in the Burma Medical Department—

On his return from leave Captain A. W. Greig, I.M.S., is appointed as Superintendent, Mandalay Central Jail, with temporary civil medical charge of the Mandalay District, in place of Captain H. H. G. Knapp, M.A., M.D., I.M.S., transferred.

On relief by Captain Greig, Captain H. H. G. Knapp, M.A., M.D., I.M.S. is appointed as Superintendent, Rangoon Central Jail, in place of Lieutenant Colonel R. H. Cato, M.B., I.M.S. transferred.

On relief by Captain Knapp, Lieutenant Colonel R. H. Cato, M.B., I.M.S. is appointed to the civil medical charge of the Mandalay District, in place of Captain Greig.

THE new rules for passing higher language examinations which are applicable to officers of I M S, in civil employ, will be found in the *Gazette of India*, dated 21st December 1907

CAPTAIN J J URWIN, I M S, Officiating Civil Surgeon, Serampore is allowed privilege leave combined with furlough for one year, viz, privilege leave for three months under article 260 of the Civil Service Regulations, and furlough for the remaining period under article 308 (b) of the Regulations, with effect from the date on which he may be relieved of his duties

ON being relieved of his officiating appointment as Professor of Materia Medica, Medical College, Calcutta, and *ex officio* Second Physician College Hospital, Major B R Chatterton, I M S, Civil Surgeon, is posted to Serampore

CAPTAIN A C MACGILCHRIST, I M S, Civil Surgeon, Punea is allowed privilege leave for three months under article 260 of the Civil Service Regulations, combined with special leave for three months under article 316 of the Regulations, and study leave for seven months, with effect from the date on which he may be relieved of his duties

CAPTAIN J W F RAIT, I M S, Civil Surgeon, on return from leave, is posted to Punea

MAJOR A F STEVENS I M S reported his departure from India on leave on the 12th October 1907

MAJOR B H DEARE, I M S, Officiating Civil Surgeon of Patna, is appointed to act as Civil Surgeon of Hazaribagh, with effect from the afternoon of the 18th October 1907, during the absence, on deputation, of Lieutenant Colonel T Grainger, I M S, or until further orders

CAPTAIN H B FOSTER, I M S, Officiating Civil Surgeon, Hazaribagh, was transferred to Baidwan, with effect from the afternoon of the 21st October 1907, and later was sent on plague duty

MAJOR A GWYHER, I M S, Officiating Civil Surgeon of Cuttack, is appointed to act as Civil Surgeon of Saran with effect from the forenoon of the 11th October 1907, until further orders

CAPTAIN L COOK, I M S, Officiating Civil Surgeon, Saran is placed on special duty in connection with plague work in Bihar, with effect from the 14th October 1907

MAJOR R. H MADDOX, I M S, Civil Surgeon, on return from leave, is appointed to Shahabad, with effect from the forenoon of the 24th October 1907

MAJOR E E WATERS, I M S, Officiating Civil Surgeon of Murshidabad, is appointed to act as Civil Surgeon of Cuttack, with effect from the forenoon of the 11th October 1907, during the absence, on deputation, of Major J T Calvert, I M S, or until further orders

WE understand that Lieutenant Colonel H Hecht, F R C S, I M S (ret'd), has in the press a new edition of his Monograph on Cataract Extraction

LIEUTENANT A F HAMILTON, I M S, has been appointed to act as Civil Surgeon, Ahmednagar, in addition to his own duties, with effect from the 9th November 1907, pending relief by Lieutenant Colonel W A Corkery, I M S

CAPTAIN T F OWENS, I M S, has been appointed to act as Civil Surgeon, Jacobabad, from the afternoon of the 7th November 1907, in addition to his own duties

LIEUTENANT COLONEL O H L Meyer, M D B S I M S, has been allowed by His Majesty's Secretary of State for India to return to duty within the period of his leave

CAPTAIN F A L HAMMOND, I M S, Civil Surgeon, Thayetmyo, received one month's privilege leave in November

DR. C MARTIN, a Civil Surgeon, Burma, has been granted extension of leave without pay for 14 days

THE following transfers and postings are ordered in the Burma Medical Department —

On his return from leave Captain F V O Beit, M B I M S, is transferred from Maymyo to the civil medical charge of the Toungoo District, in place of Captain R D MacGregor, M B, I M S, transferred

On relief by Captain Beit, Captain R D MacGregor, M B, I M S, is transferred from Toungoo to the civil medical charge of the civil station of Loimwe and the Southern Shan States, east of the Salween, in place of Major C M Mathews, I M S, transferred

On relief by Captain MacGregor, Major C M Mathews I M S, is transferred from Loimwe to the civil medical charge of the Magwe District, in place of Senior Military Assistant Surgeon and Honorary Lieutenant J Fraser, transferred

Under the provisions of article 260 of the Civil Service Regulations, privilege leave for three months is granted to Mr H E Wells, M B, C M, Civil Surgeon, Minbu, with effect from the date on which he may avail himself of it

On his return from leave Captain A Fenton, M B, I M S, is appointed to the civil medical charge of the Minbu District in place of Mr Wells, proceeding on leave

LIEUTENANT R A CHALMERS, I M S, has passed the Higher Standard Examination in Baluchi

CAPTAIN G F SEALY, I M S, and Military Assistant Surgeon W G Sandways have also passed the Higher Standard in Baluchi

CAPTAIN M S IRANI, I M S, Assistant Plague Medical Officer, Gujranwala, was transferred to Jullundur in the same capacity and assumed charge of his duties there on the forenoon of the 23rd October 1907

THE services of Captain W L Trafford, I M S, Assistant Plague Medical Officer, Lahore, were replaced at the disposal of the Government of India, in the Home Department, on the forenoon of the 1st November 1907

LIEUTENANT COLONEL C J BAMBER, I M S, Sanitary Commissioner Punjab, has obtained privilege leave of absence for three months, under article 260 of the Civil Service Regulations, with effect from the afternoon of the 29th October 1907

MAJOR E WILKINSON, I M S, Deputy Sanitary Commissioner, Punjab, is appointed to officiate as Sanitary Commissioner, Punjab, with effect from the afternoon of the 29th October 1907, *vice* Lieutenant-Colonel C J Bamber, I M S, proceeded on leave

MAJOR E L PERRY, I M S, Civil Surgeon of Kangra, is appointed to officiate as Deputy Sanitary Commissioner, Punjab with effect from the forenoon of the 15th November 1907, *vice* Major E Wilkinson, I M S

ON relinquishing charge of the duties of Civil Surgeon of Dilliwara, Major L S Peel, I M S, resumed charge of the duties of Civil Surgeon, Gudaspur on the forenoon of the 5th November 1907, relieving Senior Assistant Surgeon Krishan Chund

LIEUTENANT R H BOIT, I M S, has passed the examination for F R C S, Eng

CAPTAIN H H BROOME, M B, I M S, is posted temporarily to the Punjab for plague duty

CAPTAIN C W F MELVILLE I M S acts as Professor of Anatomy, Lahore, *vice* Lieutenant Colonel Lamont, I M S, on furlough

THE services of Captain W L Trafford, M B, I M S, are replaced at the disposal of His Excellency the Commander in Chief in India

CAPTAIN S R CHRISTOPHERS, M B, I M S, Superintendent, King Institute of Preventive Medicine Madras, is placed on special duty under the orders of the Sanitary Commissioner with the Government of India, with effect from the 1st December 1907, in connection with the Blackwater Fever Inquiry

THE services of Captain W S Patton, M B, I M S, are placed at the disposal of the Government of Madras

LIEUTENANT COLONEL F P MAYNARD, M B, F R C S, is appointed a Fellow of the University of Calcutta

LIEUTENANT COLONEL D D CUNNINGHAM F R C S I M S (ret'd) has been appointed Honorary Physician to the King, *vice* Sir Joseph Fayrer, Bait, I M S, deceased

CAPTAIN R M CARTER, I M S, is appointed to the Brigade Laboratory, Ambala, as a specialist in the prevention of disease

LIEUTENANT COLONEL F J CRAWFORD, I M S, Madras, is due out on 20th February 1908

MAJOR F C PEREIRA, I M S, has been granted one year's combined leave

CAPTAIN D C KEMP, I M S, is posted as District Medical Officer, Cuddalore

CAPTAIN W C LONG, I M S, is due out on 16th February 1908

CAPTAIN T S ROSS, I M S, Health Officer, Madras, has applied for six months' extension of furlough, i.e., up till August 1908

THE order appointing Captain E C Hepper, I M S, to act as Civil Surgeon of the Khyber Agency, is cancelled (No 3236G, dated, 23rd December 1907)

WITH the approval of the Secretary of State an exchange is sanctioned between Capt H H Kiddle, I M S, and Capt W H Odum, R A M C

THE services of Captain L Reynolds, I M S, are placed temporarily at the disposal of the Government of the United Provinces for employment in the Jail Department

THE services of Captain H C Keats, M B, I M S, are placed temporarily at the disposal of the Government of the Punjab for employment on plague duty

THE services of Captain L Hirsch, I M S, are placed temporarily at the disposal of the Government of Madras

THE services of Captain E A Walker, M B, I M S, are placed temporarily at the disposal of the Government of Burma, with effect from the 20th November 1907

WHILE MAJOR A R ANDERSON, I M S, was acting for Lieutenant Colonel R Neil Campbell, I M S, as Civil Surgeon of Dacca, Capt I H Delany, I M S, was posted as Civil Surgeon of Rajshahi District, E B & Assam

LIEUTENANT COLONEL H B MATHIAS, D S O, R A M C, has been appointed a Secretary to the P M O, H M S Forces in India, from 21st October 1907

CAPTAIN T H GLOSTER, M B, I M S, acted as assistant to the Director of the Bombay Bacteriological Laboratory from 30th September 1907, and was placed on special duty from 26th November

CAPTAIN S R DOUGLAS, I M S, has been transferred to the half pay list permanently with effect from 15th September 1907. Captain Douglas, we understand, is working in London as an assistant to Sir A E Wright

THE undermentioned officer of the Indian Medical Service, having satisfactorily completed his courses at the Royal Army Medical College and at Aldershot, has been finally admitted to the service. His commission will bear date the 2nd February 1907, and he will rank below Lieutenant D L Graham and above Lieutenant P K Turpin (vide Notification No 71, dated 27th September 1907) —

Edmund Brodie Munro

ON return from furlough Lieutenant Colonel E A W Hall, I M S, returns to Chittagong as Civil Surgeon, and Captain W Tari, I M S, is posted to Silchar as Civil Surgeon

THE following Notifications appeared in the *Burma Gazette* of 7th December 1907 —

"Mr C Martin, L R C P & S, Civil Surgeon, has been permitted by His Majesty's Secretary of State for India to return to duty within the period of his leave

Captain E A Walker, I M S, whose services have been placed temporarily at the disposal of the Government of Burma, is appointed, with effect from the date on which he

may assume charge of his duties, to the civil medical charge of the Bhamo District, in place of Captain L B Brassey, M B, I M S

Mr K Ramanni Menon, L M & S (Mad), is appointed to be a 3rd grade Civil Assistant Surgeon in Burma, on probation, with effect from the 23rd June 1907

Mr M K Pillai, M B, C M (Mad), is appointed to be a 3rd grade Civil Assistant Surgeon in Burma, on probation, sub *pro tem*, with effect from the 8th August 1907

Under the provisions of Article 336 (1) of the Civil Service Regulations, Mr A E Koib, Assistant Port Health Officer, Rangoon, was granted leave on medical certificate for three months, with effect from the 20th August 1907

Mr K P V Krishna Rao, M B, C M (Mad), officiated as Assistant Port Health Officer, Rangoon, from the forenoon of the 20th August 1907 to the afternoon of the 19th November 1907

The following appointment and posting are ordered in the Medical Department —

On his return from leave, Captain H A Williams, M B, D S O, I M S, is appointed to officiate as Resident Medical Officer, Rangoon General Hospital, in place of Captain Whitmore, M B, I M S, transferred

On relief by Captain Williams Captain Whitmore is placed on general duty at the General Hospital, Rangoon

Under the provisions of Article 605 of the Civil Service Regulations and under the Military Furlough Regulations of 1875, furlough on medical certificate for three months is granted to Honorary Captain F Bradley, I S M D, in continuation of the leave granted to him in General Department Notification No 16, dated the 20th January 1906

The period of temporary employment of Mr Pirfulla Kumar Mukerjee, L M & S (Cal), to which he was appointed in this Department Notification No 123, dated the 28th April 1906, terminated on the 21st February 1907

Mr T A Ramswamy Iyer, L R C P & S (Edin), is appointed to be a 3rd grade Civil Assistant Surgeon in Burma, sub *pro tem*

With reference to Rule 3 of the Rules contained in General Department Notification No 281, dated the 11th September 1906, Lieutenant J H Henderson, 125th Rifles, on special plague duty at Bassein, is invested by the Local Government with all the powers conferred on the Deputy Commissioner by those rules

CAPTAIN R K WHITE, I M S, Medical Officer, 17th Infantry, who was one of those attacked in the outbreak of cholera in the Commissioner's house at Chinsuri, has since been operated on for a deep seated liver abscess by the Civil Surgeon of Darjeeling and must go on leave shortly

ON return from leave, Major A Leventon, I M S, is posted as Civil Surgeon of Mymensingh and Capt T C Rutherford goes to the Naga Hills as Civil Surgeon

ON return from leave Major H G Melville, I M S, Professor of Materia Medica and Pathology, Medical College, Lahore, reported his arrival at Bombay on the 11th of October 1907, and resumed charge of his duties at Lahore on the forenoon of the 14th idem

CAPTAIN C W F MELVILLE, I M S, who has been appointed to officiate as Professor of Anatomy, Lahore Medical College, assumed charge of his duties on the forenoon of the 12th of October 1907

LIEUTENANT D C P FITZGERALD, I M S, was appointed to officiate as Civil Surgeon of Kangra, in addition to his military duties, with effect from the forenoon of the 11th of November 1907

MAJOR N R J RAINIER, I M S, on special duty, has been reposted as Civil Surgeon to Chhindwara, C P

CAPTAIN D N ANDERSON, I M S, is posted as Civil Surgeon to Chandra District, C P

CAPTAIN A M FLEMING, I M S, was granted 3 months' privilege leave

CAPTAIN E F GORDON TUCKER, I M S, on being relieved by Lieutenant Colonel C H L Meyer, M D (Lond), is appointed Civil Surgeon of Sholapur

ON completion of his special duty at Roorkee Captain H J Walton, F R C S, I M S, returned to Bulandshahr as Civil Surgeon

THE services of the undermentioned officers are placed temporarily at the disposal of the Government of the United

Provinces for employment on plague duty, with effect from the dates noted against their names —

Captain H W Illus, I M S	15th October 1907
Lieutenant W H Borth, I M S	14th October 1907
Lieutenant C E Palmer, M B, I M S	9th October 1907
Lieutenant Narendra Singh Sodhi, I M S	7th October 1907

THE services of Major P P Kilkelly, M B, I M S (Bombay), are placed permanently at the disposal of the Government of Bombay

THE services of Captain R Steen, M B, I M S, are placed temporarily at the disposal of the Government of the United Provinces

THE services of Captain R M Carter, I M S, are replaced at the disposal of His Excellency the Commander in Chief in India

MAJOR C E WILLIAMS, M D, I M S (Bomby), Health Officer of Rangoon, is appointed to be the first Sanitary Commissioner of Burma

MAJOR P P KILKELLY, I M S M B (DUB), has succeeded Lieutenant-Colonel H Herbert, I M S (retd), as Ophthalmic Surgeon, Bombay

THE following officers have been posted to plague duty with effect from dates mentioned —

Lieutenant H C Buckley, I M S, Meerut,	4th December 1907
Lieutenant H P Cook, I M S, Agra	5th December 1907
Captain G W Mcconachie, I M S, Barroilly,	6th December 1907, and
Lieutenant G A Soltan, I M S, Benares,	11th December 1907

ON return from the leave granted to him in Notification No 228, dated the 11th of March 1907, Major A W T Burst, I M S, is posted to Sialkot as Civil Surgeon, where he assumed charge of his duties on the forenoon of the 28th of November 1907, relieving Senior Assistant Surgeon Mian Baksh, Utard

CAPTAIN H C KEATFS, I M S, whose services have been placed at the disposal of the Punjab Government, reported his arrival at Gunderpur on the forenoon of the 21st November 1907, and was appointed Assistant Plague Medical Officer at the same place with effect from the above date. He was transferred to Gujranwala in the same capacity with effect from the afternoon of the 30th November 1907

MAJOR H F CLEVELAND, I M S, has succeeded Lt Col W H Elliot, D S O, as Secretary to P M O, His Majesty's Forces in India

MAJOR J G HOJEL, M B, I M S obtained three weeks' privilege leave in December

THE undermentioned officers were appointed Civil Surgeon of Jhelum for the periods noted against their respective names —

Lieutenant J F BOYD, I M S, from the 1st to the 15th of September 1907
Lieutenant K W MACKENZIE, I M S, from the 16th to the 29th of September 1907
Lieutenant J F BOYD, I M S, from the 30th of September to the 7th of October 1907
Captain R A LLOYD, I M S, from the 8th to the 30th of October 1907

On relinquishing charge of his duties at Murree, Captain D H F Cowin, I M S, resumed charge of the duties of officiating Civil Surgeon of Jhelum on the afternoon of the 30th of October 1907, relieving Captain R A Lloyd, I M S

CAPTAIN J W D MEGAW, I M S, has been granted combined leave and study leave for a total period of fourteen months and left Calcutta towards the end of December for home

DR J L HENDLEY has returned to Daltongunge as Civil Surgeon in December

MAJOR R HEARD, I M S, is appointed to the medical charge of the Army Head Quarters Staff, remaining in Simla during the winter

THE following statement shows (*Gazette of India Resolution*, dated 7th December 1907, No 7321 Ex) the English recruited services and departments and branches thereof, the members of which are eligible in the absence of any special disqualification (which may be either personal or official), to draw exchange compensation allowance —

- 1 Judges of High and Chief Courts
- 2 Military officers on salaries not fixed in sterling, departmental officers with honorary rank, and departmental warrant officers (except those of the Army Clothing Department)
- 3 Officers of the Public Works Department and Railways, of rank not higher than Executive Engineers
- 4 Officers of the—
 - (a) Indian Civil Service
 - (b) Indian Educational Service
 - (c) Indian Medical Service
 - (d) Indian Telegraph Department
 - (e) Civil Veterinary Department
 - (f) European Gardeners' Service
 - (g) State Railway Revenue Establishments
 - (h) Public Works Department, Superior Accounts Service
 - (i) Marine Department

MISS ELAINE SHAW, M B, C M, is appointed to be a Lady Doctor in Burma, on probation for six months, with effect from the date on which she assumes charge of her duties

MISS DESOUZA is appointed to be a Lady Doctor in Burma, on probation for six months, with effect from the date on which she assumes charge of her duties

CAPTAIN H PROCTOR, I M S, Superintendent of District and Female Jails, Lahore, acted as Superintendent of the Punjab Lunatic Asylum, during the deputation of Major G J W Lewis, I M S, to Calcutta in connection with the scheme for a new Lunatic Asylum for Europeans. Major Robertson Milne, I M S, Superintendent of the Berhampur Lunatic Asylum, and Major F O Kinnerly, I M S, were also on the Committee for this scheme

CAPTAIN R STEEN, I M S, is posted as Civil Surgeon of Manipal, U P

PAY AND ALLOWANCES—OFFICERS.—It is notified for information that the date of payment in England of Civil, Military and Marine leave allowances has been altered from the 16th to the 1st day of each month

Notice

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Original Articles

A NOTE ON LITHOTRITES

By D F KEEGAN, I R C S, I M S (RETIRED)

IN *The Indian Medical Gazette* (February, 1906), Major Henry Smith, M.D., Civil Surgeon of Jullundur, has drawn attention to the use of a small lithotrite in detecting the presence of small vesical calculi in children. Many years ago, when instructing the class of medical students attending the Indore Charitable Hospital, I frequently dwelt on the advantages of employing a very small lithotrite in sounding boys for stone, whenever the diagnosis happened to be difficult or obscure. And perhaps it may appear somewhat strange, that in the many papers which in those days it was my privilege to contribute to this *Gazette* on the subject of calculous diseases and their treatment, I should have omitted all reference to this special use of small lithotrite, considering that in such cases I set so much store by it. But so it was. I fancy that the reason why I did not publish my observation at the time was that I was under the impression that surgeons in India, who, like myself, were constantly dealing with cases of stone in the bladder, had already found out for themselves the advantages of employing a small lithotrite in sounding boys for vesical calculi. However, be that as it may, I am glad that my omission or oversight has, though somewhat late in the day, been made good by an observer so acute as Major Henry Smith. Yes, the employment of a small lithotrite is, as Major Smith states, the most delicate and the most business-like method of detecting small calculi in children, and to illustrate the correctness of this statement, I would briefly relate the following very interesting case which, indeed, I ought to have published at the time. Abdul Hussain, aged 12 years, came to the Indore Hospital on the 31st October 1889 along with his father. Whilst awaiting his turn among the row of outpatients seeking admission to the consultation room, the boy, in his anxiety and nervousness, passed urine involuntarily, and with the stream of mine there came a small stone. Leading in his boy to me with his left hand, the father had on the palm of his right hand a small cone-shaped stone which he told me, with evident satisfaction, that his son had just passed. He stated that for the previous four years his boy had complained of occasional pain in the lumbar region, and that during the last eight days there had been more or less irritability of the bladder. The stone just passed, weighed one and a half grains, and on examining it with a magnifying glass, I detected a small facet on it, from which I surmised that there still remained another small stone in the bladder.

Placing him at once under chloroform, for the boy was extremely timid, I passed a No 5 steel sound into the bladder and thought I felt a very small stone, but I was not perfectly sure. Withdrawing the small sound, I threw a little water into the bladder through a No 6 Evacuating Cannula and then introduced a No 4½ lithotrite, and at once a small stone *dropped* in between the blades. The stone was so small that I did not consider it necessary to screw home the male blade of the lithotrite, and holding the stone tight between the blades, I withdrew the lithotrite from the bladder and extracted the tiny concretion whole. It weighed only half a grain, and was a miniature of the one the boy had passed when waiting for admission among the outpatients. I then washed out the bladder through a No 5 cannula, and having re-introduced the No 4½ lithotrite, I again sounded the bladder very carefully, but could not detect any further calculi. The composition of the tiny stone was urate of ammonia. The father took the boy home the same evening, and as my young patient never returned to the hospital during the five succeeding years I was at Indore, I think I may safely conclude that he did not suffer from vesical calculus during that period of time. I think this case well exemplifies the exceeding accuracy of the small lithotrite in detecting minute calculi in children. On referring to my case book I find the following note appended—"The stone being so very small I have not included this case among the number of my litholapaxies in boys, although it is a very interesting and instructive case." It will be recollected that in 1888, the year before I met with this case, a rather heated correspondence had been carried on in the London medical journals regarding the vexed question "What is a stone in the bladder?" The late Sir Henry Thomson had laid it down that twenty grains was the very lowest weight, in an adult, the removal of which should be esteemed an operation for stone in the bladder. To this dictum of Sir Henry Thomson, I and others in India, for very good reasons, which need not be here specified, could not subscribe, and although Sir Henry had fixed no weight limit regarding vesical calculi occurring among children, I came to the conclusion that perhaps it would be hardly fair to designate a tiny concretion of half a grain as a stone, and so I eliminated this case from the number of my litholapaxies in boys. Nevertheless, I ought to have reported the case at the time, as showing how helpful the small lithotrite is in detecting the presence of small vesical calculi in children.

All those who have performed many litholapaxies in children are well aware that the absence of a click, when working the aspirator, is no indication that the bladder has been cleared of all debris. A small steel sound, or better still, a small lithotrite should be employed if one would be perfectly certain that no fragments are being left behind in the bladder in

the course of a litholapaxy in children. The small steel sound which I employed for years at Indore, both in sounding for stone in boys and during the performance of litholapaxy in these young patients, was a No 5 (English). Its beak was extremely short, shorter even than the beak of a No 5 lithotrite, and I found it most useful and handy. Doubtless, it is still doing good work at Indore. As a rule, I did not inject any water into the bladder on sounding for a stone in a child. I generally managed to strike the stone at once if I held the small steel sound on the lithotrite perpendicular to the trigone of the bladder, just inside the neck, and it is in this position or locality that most calculi will be found. Many small calculi are missed through passing the sound on the small lithotrite too far into the bladder, parallel to the trigone. If I failed to strike the stone after a little searching, I withdrew the small sound or lithotrite and then threw in an ounce or two of tepid water and proceeded to deliberate exploration of the entire bladder. It was always my practice when finishing off a litholapaxy in a boy, to introduce the index finger of one hand into the rectum whilst holding at the same time a small lithotrite, a small sound or a small evacuating cannula in the bladder with the other hand, and then to move the finger upwards and downwards against the instruments. Or, in other words, I rubbed the index finger in the rectum against the instruments in the bladder. By adopting this little manoeuvre the smallest particles of sand or debris remaining in the bladder were almost invariably detected by the tip of the finger in the rectum, and if recognised, recourse was had again to the aspirator until I felt quite certain that the bladder was thoroughly emptied of every particle of stone. I need hardly say that in crushing calculi in very young boys with narrow urethra it is almost of vital importance that no fragments should be left behind in the bladder. I may also here remark that the absence of a click during the course of a litholapaxy on an adult male is also no indication that the bladder has been completely cleared of fragments of stone, as we all know only too well when dealing with calculi complicated with poned and trabeculated bladders and enlarged prostates. But the dangers associated with residual fragments in adult males are trivial in comparison with those run by boys when fragments of stone are left behind in their bladders in the operation of litholapaxy. These rules of technique and these notes of warning are not intended for that large number of men of our service who are past masters in the craft of crushing vesical calculi; they are offered as the outcome of many years of experience of litholapaxy to those only who have still to win their spurs in this very special branch of practical surgery.

And now I should like to draw attention to a very important point concerning lithotrites

in general, and more especially lithotrites of small calibre. I happen to know that some manufacturers of surgical instruments are sending to India lithotrites which I can only designate as absolutely dangerous, if used by surgeons whose experience in crushing calculi may happen to be rather limited. The danger consists in supplying lithotrites of small calibre which will lock on calculi much too large for the crushing power of the instrument. If the calculus be large and at the same time of a friable nature, no damage may be done to the instrument in screwing it home. But if the stone be both large and hard, considerable danger is run in the endeavour to crush it by a slender instrument. No lithotrite should be allowed to leave the workshop until it is submitted to the severest tests and trials, and it must be so constructed that it will be impossible to lock it on a stone considered by experienced makers as being beyond its crushing power. My reason for drawing attention to this subject, is, that some months ago, I received a letter from a Civil Surgeon in the Bombay Presidency, stating that a No 7 lithotrite made by John Weiss & Sons of London could not be got to lock on a stone in a boy's bladder, but having in his possession a No 7 lithotrite made by another London maker, it readily locked on the stone, and so the crushing operation was successfully accomplished. My correspondent omitted to state the nature of the calculus, whether it was a soft or a hard stone—a very important point I may add—and his letter gave me the impression that it was considered that there was some defect or drawback in Weiss' instrument, because it could not be got to lock on this particular stone. I need hardly tell my readers in India that anything which John Weiss & Sons are ignorant of in the making of lithotrites, is not worth knowing and as a matter of routine they regulate the locking scale of their lithotrites in accordance with the crushing power or capacity of the instrument. Their No 5 lithotrite will lock on a calculus $\frac{1}{2}$ inch in length, then No 7 and then No 10 lithotrites will lock on calculi $\frac{3}{4}$ inch and $1\frac{1}{4}$ inch in length respectively, and so on up the scale. John Weiss & Sons are too jealous of their well established reputation to allow any lithotrite to leave their workshops which could be made to lock on a stone which might tax unduly the crushing power of their instruments. When inspecting the exhibition of surgical instruments on view at the meeting of the British Medical Association in Toronto in 1906, I saw some specimens of English-made lithotrites, which, to put it mildly, fairly astonished me,—lithotrites which I for one would not have the courage to employ. The blades of some of these small calibre lithotrites were much longer and therefore proportionally weaker than they should have been, and they were so constructed that they could lock on calculi far too large for their crushing power. I pointed out

these defects to some of those who were exhibiting these instruments, and I can only hope that my having done so, may have had a salutary effect. The blades of lithotrites should be cut from a solid block of the best steel which money can procure. And nowadays I fancy that this is always done by surgical instrument makers who are jealous of their reputation and good name. It is better far that the steel used in fashioning the blades of a lithotrite should be even too highly tempered than that it should be of an inferior grade and be liable to bend or to warp. The breaking of the blades of a lithotrite is a trifling accident compared to the bending or warping of the blades in the course of a litholapaxy. For if the blade should break, the broken bit may still be seized, end on, by a second lithotrite, and safely extracted from the bladder, by an adept in using lithotrites. Or, it may possibly be sucked out of the bladder by means of a straight canula attached to a debris extractor. Should these two methods fail, the surgeon can always fall back on a median or a lateral lithotomy and extract the stone and the piece of the broken blade together. But if the lithotrite becomes bent or much warped in the bladder in the course of a litholapaxy, a very serious condition of things ensues, a condition so perplexing that it will try the nerve, self-possession and courage of most surgeons. To give point to these observations, and to show how much depends on only using the most trustworthy lithotrites which money can procure, I think it well to relate very briefly the following personal experience. It was during the Christmas holidays in the middle of the eighties—I forget the exact year—that I paid a flying visit to Agra. About this period of my career in India, I was doing my best, along with others, to render Bigelow's great innovation in the treatment of vesical calculus popular among men of our service, and I had contributed a few papers to the *Indian Medical Gazette* on litholapaxy. I went to the Civil Hospital and made the acquaintance of the Civil Surgeon, the late Dy Surgeon-General Arch Hamilton Hilson, who was going round his surgical wards at the time of my visit. Hilson, like many other surgeons in the Punjab and the North-West Provinces as they were called in those days, had had a very large experience of lateral lithotomy, but had not yet adopted litholapaxy. As a matter of course, our conversation turned on Bigelow's operation, and he remarked that he was about to give litholapaxy a trial, and said that he would feel much obliged if I would give him some practical hints regarding the operation. I had not my own instruments with me at the time, and as good luck would have it, there was not a patient in the hospital suffering from stone in the bladder, and I was unable to prolong my stay in Agra, being obliged to return to Indore the next day. There were, however, a couple of lithotrites, a debris extractor, and a few canulæ

in the hospital which had but recently arrived from England, all made by a well-known London maker, and I, therefore, proposed that we should then and there repair to the post-mortem room and perform a litholapaxy on the cadaver. Selecting an uric acid stone of medium size from a heap of calculi which Hilson had removed by the time-honoured lateral lithotomy, we opened by a suprapubic incision the bladder of a young man who had died in hospital the day before my visit, dropped the calculus into the bladder, injected a couple of ounces of water and then sewed up the incision. Selecting one of Hilson's lithotrites, a No 14 Thompson's handle pattern, I passed it per urethram into the bladder, seized the stone readily and then locked the lithotrite on it. Handing the instrument to Hilson to screw home the male blade and break up the calculus, I stood by to watch and give hints. Hilson was a tall powerful man and proceeded to work the screw with very considerable vigour. He certainly had not acquired the knack of "humouring" the stone and rather rushed at his fences. When he had turned the screw for some little time, and no breaking of fragments was audible, I advised him to cease the screwing movement and to unlock the lithotrite and pull back the male blade. He accordingly unlocked the instrument by pushing forward the button on the handle, but do what we could, the male blade remained immovable, and the lithotrite with the stone, firmly grasped by the blades, conveyed the sensation to the hand as if it were a fixed body in the bladder. We accordingly took out the sutures in the bladder and looked in to see the state of affairs, and then we found both blades of the lithotrite twisted and warped into an irregular curve, corresponding in shape somewhat to the letter C and holding the calculus immovably grasped in its jaws. By means of a hammer and chisel we succeeded in freeing the calculus from the jaws of the lithotrite, but still we found it impossible to draw home the male blade, and, therefore, we could not withdraw the lithotrite from the bladder per urethram. Hilson then proposed to send to the bazar for a blacksmith (*lohan*) to file through the blades close to the handle, and so extract the twisted and curled up blades suprapubically. This method of surmounting our difficulties would have taken a considerable length of time to accomplish, and to make matters worse, the friends and relatives of the dead man were meanwhile clamouring to remove the body to the burning-ghât. Accordingly, I suggested to Hilson that we should extend the suprapubic incision to the symphysis pubis, saw through the symphysis and split up the penis and the urethra on the dorsal aspect from the meatus urethrae to the incision already made in the bladder, and so lift out the lithotrite from the cadaver and this was rapidly accomplished. I need hardly say that our morning's experience in the post mortem room had made a very deep

impression on both of us, and provided mental food for keen reflection. Hilson, at my suggestion, wrote home next day to Weiss & Sons for a supply of trustworthy lithotrites, and as I journeyed back by rail to Indore, I then, and for many a long day afterwards, blessed my stars that at the time of my visit to the Agra hospital there had been no patient suffering from the presence of a large and hard stone in the bladder, for if there had been such a case, I myself should most certainly have attempted to crush it with the lithotrite which had curled up in the bladder of the cadaver.

EPIDEMIC DROPSY IN THE DARJEELING DISTRICT

By D. MUNRO,

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DURING the rains of 1907 a number of people in the Darjeeling District were reported to be suffering from a disablement associated with swelling of the limbs and body, which was also said to be causing a considerable mortality. *Beri-beri* was suspected. During December 1907, I was occupied in investigating the nature, and as far as I could ascertain the causation, of the disease. I had previously seen cases in September, which I had then thought to be *beri-beri*.

I.—NATURE OF THE DISEASE

December was not a good month for examining cases, the disease having been more prevalent during the rains. In all I examined 113 people who were either at the time, or said that they had been recently, suffering from swelling. In 43 out of these the histories were too indefinite, and the physical signs too slight, for me to make any diagnosis. Some were very like cases of ankylostomiasis, and others were certainly cases of chronic cardiac disease in old subjects. The remaining 70 cases which I examined gave histories and presented physical signs of a disease resembling *beri-beri*. They may be divided into (a) acute cases, (b) cases in various stages of recovery. I saw no cases which I could diagnose as commencing cases.

(a) *Cases in an acute stage*.—Of these I saw eleven, the following is an account of one taken from notes made on the spot—

"A female, Tamong Bhutea, aged 25, history of previous slight attacks of swelling every year in the rains for the last 3 years. Present illness began two months ago with fever and tingling sensations in the limbs, pains all over the body but not specially in the joints. Present state is one of general cedema of face, body and limbs. She is unable to rise from a lying posture. Muscular hyperæsthesia not only confined to calves of legs. Knee-jerks absent. Temperature 98.2°F. Pronounced anæmia. Pulse

rate 108. Heart can be seen palpitating all over chest, and veins pulsating in neck. At every valve on auscultation there is a murmur. Dyspnoea distressing. No signs of paralysis or patches of anæsthesia. No enlargement of spleen or liver. Urine not increased in frequency or quantity, and clear normal evacuation from the bowels daily. Mental condition good. Lives in a hut with two other persons, neither of whom are or have been affected."

The other ten cases were similar with histories of fever and swelling at the commencement of their illness.

All but two mentioned subjective sensations of tingling and pain in the limbs. When I saw them, all were suffering from general dropsy with precordial distress, a quickened pulse rate, and heart murmurs on auscultation. Nine out of the 10 were anæmic, and 7 exhibited muscular hyperæsthesia. Six of them had temperatures, ranging from 99.8°F to 101°F. In five of the ten cases, the knee-jerk was absent, in five present and in one of these exaggerated. None of the cases showed any signs of paralysis or anæsthetic patches. There was no rash to be seen. Scabietic symptoms were absent. These acute cases were scattered over the district at various elevations.

(b) *Cases in various stages of recovery*.—Of these I examined 59, 41 gave a history of fever at the start with subjective sensations of tingling, pain in the limbs, and sometimes joints, swelling, and breathlessness. Too much reliance, however, cannot be placed on the statements of these hill coolies. They are apt to say what they think they are wanted to say. Three of these 41 also voluntarily mentioned initial diarrhoea as a symptom. Of the remaining 18, 5 gave similar histories without mentioning fever, and 2 similar histories without mentioning tingling or pain. The other 11 gave histories of swelling and breathlessness only.

With regard to the condition on examination of these 59 cases, 43 had cardiac trouble, 31 were anæmic, 35 had no knee-jerks, 30 had slight cedema of the shins and dorsum of feet, and 19 had tender calves, or at least said their calves were tender when I pressed them, though I noticed that only one or two of them actually winced. None had any symptoms of paralysis or patches of anæsthesia. Dividing up these cases into groups according to the symptoms each had, a large number of groups would be obtained according to combinations of the various symptoms complained of and physical signs elicited. Suffice it to say, that not more than 10 cases had pretibial cedema, cardiac lesions, tender calves, anæmia and lost knee-jerks, 3 had all these symptoms with the exception of the lost knee-jerk, and of the remainder every case had at least three out of these five signs.

Twenty-four of these I have called cases in various stages of recovery were cases which I had

seen in the Nagri Valley in September, and then diagnosed as *berri-berri*, and it is noteworthy that out of 71 cases I saw then only 24 were still ill after a lapse of three months, and these were much recovered from the condition in which I had seen them last. In September I diagnosed *berri-berri* on the strength of the four symptoms—œdema, lost knee-jerks, muscular hyperæsthesia, and circulating disturbances such as quickened pulse rate and dilated heart.

Even then, however, I noted the absence of symptoms of atrophy, paralysis and patches of anæsthesia, and that impairment of the knee-jerk was only present in 45 out of my 71 cases. In December, I was even more struck by the absence of paresis as a symptom, and by the fact that I never came across cases of what H. Wright calls "*berri-berri* residual paralyses." Such cases one would be almost bound to meet with in a district where true *berri-berri* had been widely prevalent. Anæsthesia and paræsthesia were also noticeably absent. On the other hand, fever, which is not characteristic of true *berri-berri*, was actually present in 6 out of my 11 acute cases, and a history of it frequently to be obtained in the recovering cases.

This was a point to which I had not paid much attention in September, but in those 24 cases I had the opportunity of re-examining in December, enquiry brought the answer, whether reliable or not, I cannot say, that fever had been present in nearly every case.

Paralytic symptoms, muscular atrophy and the absence of any definite pyrexia are points insisted upon by all observers of true *berri-berri*. Accordingly I came to the conclusion that the epidemic, whatever it was, was not *berri-berri*. Of the diseases that resemble *berri-berri*, epidemic dropsy bears the closest resemblance, if indeed the two are really and truly distinct diseases at all. On reading up the literature of this disease, I found the published accounts to tally so exactly with the disease from which my acute cases described above were suffering, that I have now no doubt that the epidemic in the Darjeeling District is the same disease as that described as epidemic dropsy by Macleod, Crombie, Morehead and others in 1878.

The principal symptoms of epidemic dropsy as described in the published accounts are—

(1) Pyrexia at the onset, (2) burning and tingling sensations in feet and limbs at onset, (3) œdema, usually at first pitting, but which may become general, (4) intestinal troubles, especially diarrhoea, (5) always dyspnoea and palpitation, (6) anæmia, (7) cardiac attacks, which may be fatal, (8) skin eruptions occasionally, (9) great prostration.

Absence of urinary troubles is mentioned, as opposed to *berri-berri*, and the absence of paralytic symptoms is insisted upon. The case I described above is a picture practically presenting all these symptoms, together with the absence of those symptoms of paralysis and urinary trouble

which differentiate from *berri-berri*. In epidemic œdema the duration is said to be about two months, but the dropsy may not disappear for a much longer time. This corresponds with my experience in the Darjeeling District. The liability to death from cardiac angina also corresponds with the descriptions given to me in the Darjeeling District of the sudden end of fatal cases. The outbreak in the Darjeeling District was then, in my opinion, the disease described as "*epidemic œdema*" distinct from *berri-berri*. In my opinion also the outbreak at the Victoria School, Kurseong, in September 1907, was one of the same disease. I am inclined to think now that the cases in the Alipuri Reformatory School in September and October 1907, were also epidemic dropsy. I saw these cases at the time and agreed that they were *berri-berri*, and they have been published as *berri-berri* (*I M G*, February 1908), but they conform more to descriptions of the other disease.

II—INFECTIVITY OF THE DISEASE

In September, I gave as my opinion that it was a place infection, that certain huts were *berri-berri* huts, and that the coolies who lived in these huts, became infected and few members of the family escaped. I said this because of the 71 cases I saw then only 21 were single, *ie.*, there was no one else affected in the same dwelling-house. The evidence I collected in December, however, goes to show that the disease is not so actively infectious or contagious. Of the 70 cases seen, in no less than 55 there was no history of any other person in the hut being affected. In others, however, two or three people were affected, and in some the whole number of inhabitants. The following is an example of one tea-estate. I inspected a number of estates in a similar manner.

(i) Population of the estate	415
(ii) Number of cases with history of swelling	37
(iii) Number of death	1
(iv) Number of infected huts	21
(v) Proportion of infected to healthy huts	21 163
(vi) Proportion of infected to healthy people in the huts—	
One person living alone in hut	1 hut
One person out of more than one in hut	12 huts
Two persons out of more than two in hut	3 "
Three persons out of more than three in hut	1 hut
All persons in hut affected	4 huts
(7 in one hut, 4 in another, 3 in the third and 2 in the fourth)	
Total	37 cases in 21 huts

From this it will be seen that the evidence is contradictory from the point of view of infection. I inspected a large number of huts, where cases had been reported. In more than half, the cases were single, but multiple cases occurred in a sufficient number of huts to arouse suspicion of infection by contact. The huts themselves were scattered—no definite block

or group could be made out as a focus. Twenty-one huts had a history of infection in previous years. In this connection I should mention that 19 of the 70 cases stated that they had had previous attacks of the disease in preceding years. There seems indeed to be a chronic periodic infection.

III — DISTRIBUTION, INCIDENCE AND MORTALITY OF THE DISEASE

I found the disease prevalent in all parts of the district and at all elevations, from the Taiar up to 5,000 ft. Most of the population of the district consists of the labour on tea-estates. To the tea-estates I therefore confined most of my attention. From my own investigations, and from returns furnished by managers of estates, (for which I have to thank Dis. Seal, Humphry and Newell) I have compiled some statistics, they cannot be regarded as accurate, in the first place, because the exact populations on which they are based are not known, and in the second, because accurate records of cases of sickness are kept up on very few estates. I have selected the returns from the tea-estates, in number 30, which were able to give definite information. Of these the estimated total population is 19,581 people. The number of attacks of the disease in 1907 was estimated by the managers at 742, with 149 deaths.

On these statistics 37.5 per 1,000 suffered from the disease in 1907, whilst the death rate was 7.5 per 1,000 of the population and the case mortality 20.3 per cent.*

With regard to age and sex, I noticed that the majority of the cases I saw were young women. It must be remembered, however, that most of the labour on tea-estates is young, and more women than men are employed.

IV — CAUSATION OF THE DISEASE

Even though the disease be not *ber-ber*, there is still the same problem as to the cause of epidemic dropsy. And may it not be the very same? *Ber-ber* is so alike in its symptomatology to epidemic dropsy, that it conceivably may be but a slightly dissimilar effect of an only slightly dissimilar, or even precisely similar cause. The diseases have been frequently confounded. Manson says that at the time of its first occurrence in Calcutta many of the physicians there looked upon it as a form of *ber-ber*. Fayrer described the epidemic in Mauritius in 1879 as *ber-ber*. Braddon (*Cause and Prevention of Ber-ber*) gives several instances of the diseases being confounded even as late as 1902. The same cause has also been, with some evidence, suspected for both. In an outbreak of epidemic dropsy at Ascension during the years 1895-98, Braddon (*op cit*) states that the disease seems clearly to

have been associated with inferior diet, rice being most probably at fault, and to have ceased when more generous rations were provided than are generally given to natives.

I conceive that the disease must be either (1) an infection of bacterial or parasitic origin, or (2) a disorder of nutrition, or (3) a chronic intoxication.

(1) *As a bacterial disease* — In September I noticed that most tea garden coolies slept on the floors of their huts, and that their bodies were covered by numerous parasites, of which, when a number were removed for examination, the majority proved to be pediculi. I thought that these might possibly play some part in causation. In the Victoria School epidemic, however, such a possibility was absolutely negatived.

In favour of its being a bacterial disease, there is its seasonal recurrence at a time when temperature and moisture are high and suitable to increased bacterial growth and virulence. On the other hand, there is, in my opinion, strong evidence against its being a bacterial disease.

(1) If bacterial, one attack certainly does not confer immunity. On the contrary, the histories I obtained shew that many suffer from repeated attacks.

(2) Lack of evidence as to an incubation period. Where several persons in a hut were affected, the intervals between cases I found to vary from days to months.

(3) Its incidence does not correspond with any known method of bacterial infection. Thus, the evidence is reliable that in many huts only one person was affected out of several living in the hut. The conditions of overcrowding, ill-ventilation and general foul sanitation of coolie lines need no description here. Any infection that could be carried by the breath or secretions of a patient could here hardly escape being conveyed.

The incidence of the disease cannot be connected in any way with infected water supplies. It is widespread over a district with particularly pure water supplies.

Mosquitoes are out of count, as the disease occurs at altitudes beyond their range. Body parasites are negatived by the Victoria School epidemic and also, I think, by the distribution of the cases in the huts, *i.e.*, the majority of cases being single cases. Air, water, secretions and excretions of patients, insects and body parasites put aside—there remains food. In this connection I enquired into the possibility of the coolies eating cold food, especially rice, that had been cooked overnight. I found this habit not indulged in. They eat their meals as soon as they are cooked. The cooking process should be enough to destroy any ordinary bacteria. They are not milk drinkers. That the disease is conveyed in food—the food being merely a vehicle and medium for the germ—as

* A point insisted upon by the managers is that the disease is not a new one. It has been there long, prevalent in the district for years but only specially so this year.

milk conveys cholera is the most possible solution of its mode of infection, if the disease be a bacterial one, but I think the evidence is against it.

(4) One would expect a bacterial disease to attack particularly the lowest and dirtiest castes of coolies, and to play havoc amidst blocks and groups of specially filthy and insanitary lines. In the Darjeeling District it shewed no such selection.

(5) The marked benefit to cases from a change of dwelling place (which usually involves a change in food). A bacterial infection would be likely to pursue its specific course independent of the movements of the patient.

(2) *As a disorder of nutrition*—Prices in the Darjeeling District for the last two years have been specially high, and whilst carbohydrates, fats and salts are obtained in sufficiency, a certain amount of nitrogenous starvation is wide-spread. Burmah rice has been largely imported into the district of recent years, and rice is the staple food of the coolies. Rice also bulked largely (best Bengal rice) in the dietary of the Victoria School before the outbreak. Rice prepared in Burmah is stripped of its pericarp, and with its pericarp of much of its aleurone layer, containing all the proteid matter, so that the grain is deprived of much of its nutriment. It has been recently shewn also that oedema and polyneuritis can be produced in animals by feeding them on de-corticated grain (Holst and Froehel, *Journal of Hygiene*, Vol 7, Oct 1907). *Apropos* of this I may mention for what it is worth, the case of two dogs on a tea estate which I visited. Their food was changed from dāl and Bengal rice to dāl and Burmah rice, and in a few weeks both dogs died with symptoms of oedema and paralysis.

Insufficiency of vegetables was also inquired into owing to the possibility of a scorbutic element in the disease. This suspicion was not borne out. I satisfied myself that the coolies are able to obtain vegetables in variety at all seasons of the year. I do not think the evidence against a physiologically incorrect diet as a cause of this disease is strong enough. I think, however, that it may very easily be a factor in lowering the resistance to the effects of a poison, and in this connection must be added in the case of coolies, exposure to wet in insufficient clothing. At the time of the chief prevalence of the disease, the coolies are constantly exposed to wet. Further, of late years, since the price of living has been steadily rising, they dress in cheap cottons instead of the more expensive woollen garments.

(3) *As a chronic intoxication*—If not either a bacterial infection or a disorder of nutrition it may be, as I said, a disease due to chronic poisoning of some kind. I have already advanced arguments against air, water or insects as the vehicle. It remains to consider food. A poisonous food would account best for the

epidemiology of the disease as I have observed it. It would be most improbable that all sources of food were poisoned. A stock supply of one particular article of diet might be poisonous, and, further, the poison might not be equally distributed in each sample. The consumption of varying amounts of this food, together with varying susceptibilities on the part of the consumers, would account for all of them not being attacked. The fact of one person only in a hut being attacked could be explained on this theory. A poison of the nature of a ptomaine, such as is produced in meat by the fermentative action of bacteria, would remain toxic even when the food had been cooked.

The question that arises is, if a food intoxication, what article of food is it that is poisonous? The following are the chief articles of diet eaten by the coolies—Rice, dāl (chiefly the variety known as *kalar dāl*), Indian-corn, mustard oil, vegetables, condiments, and water as a beverage. Some of the wealthier eat meat, and drink country spirit occasionally. Of these rice is the staple food, especially during the rains. From numerous inquiries I gathered that from $\frac{1}{2}$ lb to 1 lb is the average daily quantity of rice eaten per person. With the exception of Indian-corn in its season, no other food is eaten in so large a quantity as this. Dāl averaged 2 to 3 oz daily and mustard oil 1 oz, vegetables varied. These remarks do not apply so much to parts of the district nearer Sikkim where Indian-corn is largely eaten, more largely I was told than rice even in the rains. In the cold weather a kind of bread is made from flour of millet seed, which seed is also fermented to make a sort of beer.

Among these articles of diet mustard oil was blamed by the coolies themselves for causing the disease. A sample I had analysed by the Chemical Examiner, Bengal, shewed adulteration with some unknown oil. If any article of diet is to be blamed, however, I think it should be one that was also in use in the Victoria School, Kurseong. There, before the outbreak, whilst meat, bread and butter were eaten, rice and dāl also bulked very largely in the diet. After the exclusion of these two articles from the diet, the outbreak stopped. This, of course, may not have been cause and effect. Of these two articles, the only two common to both the coolies and the schoolboys, if either is to be blamed, one would naturally choose the more largely used, and that was certainly rice. Dāl, however, should not be dismissed from suspicion, especially when one remembers its connection with lathyrism, a disease also with symptoms of nerve implication. Rice has long been suspected with much evidence of causing the very similar disease, beriberi, and it seems to me that epidemic dropsy also falls under suspicion as a grain intoxication.*

* Its recurrence in the rains also corresponds with a time when local rice being unobtainable, imported rice is being eaten.

With regard to the nature of the poison, there are many fermentative processes which produce stable poisons. I have mentioned ptomaines in meat, alkaloidal bases produced by bacterial ferments. Alcohol is a poison produced from grain by the fermentative action of a vegetable organism (yeast) after the grain has first been subjected to diastatic fermentation, and Alcoholic neuritis is a classical example of a disease with symptoms resembling beri-beri, and to some extent epidemic dropsy. Braddon in his book "The Cause and Prevention of Beri Beri," after summing up his evidence against rice in that disease, gives several examples of fixed poisons produced in grain by ferments, and suggests as the ferment in the case of beri-beri. Some minute, possibly microscopical, epiphytic or parasitic organism in the husk, which may invade the seed, especially when stripped as in the method employed for preparing rice in Rangoon. Whole crops might be invaded in the ear by this organism one season, and be quite free from it another.

In the Darjeeling District, owing to scarcity, much rice has been imported during recent years. I took many samples and found them very inferior in quality—most were weevil. The majority was Burmah rice, and even in rice sold as Bengal rice, I found Burmah rice mixed. I noticed that whereas on biting across a grain of country rice a clear waxy fracture results, in a grain of Burmah rice a floury degenerated appearance is often seen in the centre. Patches of this appearance can also be often seen with the naked eye on the outside of grains of Burmah rice, but never on Bengal rice.

I would mention here that in the cases of two tea gardens which reported no cases of cedema, the only different conditions I found were, that in the one which was on the borders of Sikkim, Indian-corn was eaten almost to the exclusion of rice, in the other, which was very close to Darjeeling, the rice was mostly Bengal rice bought in Darjeeling, in contrast to other estates I went to, where the rice was bought in bazars in the valleys, and was Burmah rice. It is not certain that there had been no cases of cedema on those estates. I merely could not find any at the time, and the managers did not know of any.

V—PREVENTION OF THE DISEASE

Apart from clinical and bacteriological observations on cases in search of a possible germ, I think some prolonged investigation into the relation of the food-supply to the disease is needed, some investigations such as in the case of rice and beri-beri have been carried out by Braddon in the Malay States. Feeding experiments on a large scale and prolonged are also needed, on identically situated and constituted groups of people. Chemical analysis of suspected food for change in its composition is also needed. With regard to places where the disease is prevalent, the

adoption of a more generous diet, particularly at the expense of the rice ration, would, I believe, do more than segregation and disinfection measures to stamp out the disease. I believe that such a measure taken alone would be successful, and in any case, a trial of it would go far to prove whether the disease was really connected with food-supply or not.

ON THE PROBABLE IDENTITY OF BERI-BERI AND EPIDEMIC DROPSY

By FREDERICK PEARSE, M.D., M.R.C.P.,

Health Officer, Calcutta

THE recent outbreaks of beri-beri and epidemic dropsy in Calcutta and Howrah afford strong grounds for believing that we have only one disease to deal with, and not two as has been hitherto supposed. The so-called epidemic dropsy which was first described in 1877 on the strength of a few cases has re-appeared in this city during the past six months. A much larger number of cases have been observed, and during the same period, there has also occurred an unmistakable outbreak of beri-beri in the Alipore Reformatory. In the absence of and positive or even negative bacteriological evidence, we must for the present fall back upon a comparison of the courses and symptoms recorded for these cases. Let us consider the symptoms of so-called epidemic dropsy. The most essential symptom is said to be dropsy-cedema of the lower limbs first occurring, the trunk and upper extremities being subsequently affected in severe cases. Pyrexia, more or less, generally less, occurs early, and there are burning and pricking of the skin and deep-seated pains in the limbs. The cedema may be slight and limited to the feet, but in some cases is extensive and serious effusions occur in the pleura and pericardium, and vomiting and diarrhoea are recorded as frequent premonitory symptoms. A kind of erythematous rash affects parts of the lower limbs. Dry cough, dyspnoea and anaemia occur in severe cases. There is more or less prostration which is very marked in certain cases. In the earlier outbreaks no anaesthesia or paralysis was observed, and some authors stated that the knee-jerks were invariably present, and that though deep-seated pain in the muscles was complained of, no tenderness of the calves could be elicited. The duration of the disease varies considerably, and debility, anaemia and cedema are the symptoms usually prolonged. Death is due to pulmonary and cardiac complications, and in some cases is sudden and unexpected. Later accounts refer to dilatation of the heart, hæmic murmur and palpitation, and the pulse is described as soft.

Now, in the recent outbreak we have had in Calcutta cases showing all degrees of severity of the above-mentioned symptoms. Several deaths have occurred. Deep-seated pain with

distinct tenderness of the calf muscles has been frequently reported. In some cases wasting of the calf muscles has been noticed and the knee-jerks have been distinctly impaired or absent. There has not been any absolute paralysis, but muscular weakness with unsteadiness of gait has been observed in several cases. Cardiac troubles shown by shortness of breath, palpitation, reduplication of sounds, rapidity of pulse, irregularity of beat, murmurs and faintness have been frequent.

The differentiation of this disease from beri-beri has been based almost entirely on the more marked nervous phenomena characterizing the outbreaks of beri-beri and upon the absence of typical beri-beri cases in outbreaks of epidemic dropsy. The occurrence of paralysis of unmarked anaesthesia over certain areas, and of loss of the deep reflexes are particularly relied upon. There are some who go so far as to make the existence or absence of the knee-jerk a test for the two diseases—absence negating epidemic dropsy. At the same time there are a considerable proportion of cases in a beri-beri outbreak, which taken alone would be absolutely undistinguishable from so-called epidemic dropsy. Amongst the Alipore Reformatory series of 50 cases of beri-beri there were two deaths, many of the patients had tingling and weakness in the lower extremities, but the knee-jerk was normal in 18 cases and exaggerated in five others, only in a few cases was anaesthesia detected, and there were but eight cases showing any definite parietic condition. The negative symptoms are important, because they are common to both classes, the central nervous system was unaffected, the lungs themselves showed no lesions, the digestive functions (except for a preliminary vomiting and diarrhoea noticed in some of the cases) seemed unimpaired and there was no albumen in the urine.

In view of these nerve symptoms, it can hardly be argued that the reformatory outbreak was not beri-beri, but one of epidemic dropsy, and yet there were in this localized outbreak nearly 75 per cent of the cases showing very mild symptoms and those symptoms were identical in character and also in degree with those shown in the other "dropsy" cases which cropped up in various houses scattered over the city.

Beri-beri is described as essentially a form of peripheral neuritis, but the majority of the symptoms found in epidemic dropsy are common to the two diseases. Some writers lay great stress upon the occurrence of anaemia in the cases of so-called epidemic dropsy, whereas they say it is not observed in beri-beri patients. The blood conditions have not up to the present been sufficiently investigated to lay down any definite distinction between these two classes of cases.

Other writers lay stress on the fever, but a rise of temperature is only noticeable in a limited

number of cases of epidemic dropsy and may equally occur as a variable symptom in beri-beri. Similarly with the eruption. This is a very variable sign and only occurs in a few cases. It is mostly associated with some oedema, although not necessarily over an oedematous part. Moreover, this eruption is not always of the same character.

There is absolutely nothing known connected with the causation of either disease, which helps us to distinguish them. They are both essentially household diseases—cases occurring in batches only where people are closely associated together. There is little fever in either disease, and when it is present, it does not pursue any regular course.

On the other hand, the combination of symptoms in the two complaints is very similar. The greater or less oedema, especially over the shins, the hyperaesthesia and deep-seated pain in the legs, the cardiac symptoms and the mode of death are common to both. The dropsy is shown in the same special and characteristic manner even to effusion in the pleural and pericardiac sacs, the digestive functions go on practically undisturbed, and the urine is free from albumen. Even the nervous phenomena, if of less degree, are identical in character, *viz*, those of a peripheral neuritis. McLeod says that epidemics of dropsy have been repeatedly observed on land and at sea, but that it is difficult to decide whether they were instances of "wet" beri-beri or of epidemic dropsy. The nervous phenomena do not always declare themselves in an outbreak of beri-beri, and oedema without albuminuria may occur and remain almost the only symptom. The conditions found *post-mortem* are in no way characteristic, but are similar in the two diseases.

For the recent outbreak in Calcutta there is not the slightest evidence to attribute the cause to Burmah rice or any kind of food. Epidemic dropsy seems to be an acute specific epidemic and communicable disease in which dropsy with slight involvement of the nerves of the lower extremities are the chief initial symptoms. From a few observations I have been able to make an incubation period of three to four days seems probable.

The combination of oedema, with symptoms pointing to peripheral neuritis, with "rheumatic" like pains and with disordered heart action, is only known to these two diseases. All the symptoms in the two diseases are similar in character, if not always in degree, and cases occur in outbreaks of each disease which are indistinguishable, the one from the other. Finally, death is brought about in a similar manner—sometimes suddenly and sometimes slowly—by nervous disturbance of the heart's action. I cannot but think we shall have to look to some one specific microbe as the cause of both diseases.

THE USE OF IPECACUANHA IN HEPATITIS *

By J G MURRAY, M B (Edin.),

Captain, I M S,

Presidency General Hospital, Calcutta

THE subject of acute hepatitis has been brought prominently to our notice by several cases which have lately been under treatment in the Presidency General Hospital, and the following are the records of some of the cases which show very strikingly the value of ipecacuanha in the treatment of that form of hepatitis which follows upon dysentery—cases which we know so frequently drift on to the formation of liver abscess.

In fact, so marked were the symptoms and signs in some which I shall quote that I think anyone would have been justified in exploring the liver for abscess, and yet the condition entirely cleared up under ipecacuanha and no other treatment. In one instance, the liver *was* explored in five places with negative result, and on ipecacuanha being given again, the inflammation completely subsided. These cases of hepatitis are often characterized by a very insidious onset, fever is usually present, and one frequently obtains the history that the patient has been treated for some time with quinine without any beneficial results. In the great majority of instances, a history of recent dysentery or *dysentery* can be obtained, and in one case the patient was actually under treatment for dysentery when acute hepatitis developed. As an aid to diagnosis, firstly, I would mention the leucocyte count, which has been so thoroughly worked out by Major Rogers. It is of great value especially in those very indefinite cases, a leucocytosis of varying degrees being usually present, and one in which the polymuclear cells remain at or near their normal percentage. Secondly, the X-rays. The absence of any definite shadow in the liver substance excludes in the great majority of cases, the presence of an abscess although the diaphragm on the right side may be seen to be firmly fixed while it moves freely with respiration on the left.

So firmly do I believe in ipecacuanha for such cases that, I expect we shall find in time that if more of them are thoroughly treated with this drug in the stage of acute hepatitis, the formation of the hepatic abscess will be prevented. *It must be clearly understood that only cases in the presupplicative stage are referred to*, I do not, for one moment, mean to imply that once an abscess has formed, ipecacuanha will be of any use whatever.

I have records of cases treated in hospital for hepatitis following dysentery without ipecacuanha discharged apparently cured but only to

return at a later date with an abscess actually present. So far I have not been able to trace the same in a case *thoroughly* treated with ipecacuanha in the early stage. It is true that only recently have cases of post-dysenteric hepatitis been treated thoroughly with that drug, so it is early yet to dogmatise, but I think it will be obvious to anyone that a great advance will have been made in tropical medicine if by any means we can diminish the number of liver abscess cases, and should this prophecy come true, we shall undoubtedly owe a very large debt to Major Rogers for the valuable work ~~he~~ ^{he} has done and is doing on this subject.

In conclusion my thanks are due to Lt-Col Pilgrim, I M S, and Capt J C Holdich Leicester, I M S, for kindly allowing me to make use of the notes of cases they have had under their care.

CASE I—H M M, *et* 26, with chart—

This patient suffered from dysentery in December 1906, this attack lasting for a month, he had a second slight attack in February 1907, and in July 1907 he began to get fever of an intermittent type with frequent sweats at night and pain over the liver. For this he was treated with quinine with little or no effect, and was brought down to the General Hospital on 20th August with marked signs of hepatitis. He was under treatment for 25 days, the fever lasting for 15 days after admission to hospital. A moderate degree of leucocytosis was present, and X-rays showed no shadow in the liver substance.

He was readmitted on 26th November 1907, suffering again from fever, severe pain over liver and profuse sweating at night. Tongue furred, patient anæmic, thin and wasted. Liver considerably enlarged, extending 3 inches below the nipple line, painful and tender, distinct fulness over lower intercostal spaces on right side, and movements restricted as compared with left side, patient unable to take a deep breath. In fact, at this stage, he had all the appearances of being a case of liver abscess. A blood count showed 15,000 leucocytes with 70 per cent polymuclears, red cells 3,570,000, 1 white to 236 red. X-rays movements of diaphragm very much restricted on right side, no shadow seen in liver substance.

He was put upon ipecacuanha at once—giss xxx the first time, and after that giss xl each night at bed time for four days, and the temperature chart will show at a glance the result of the treatment. On the sixth day after admission the temperature remained normal for 24 hours, and continued so from that date, the ipecacuanha treatment was continued for some time after the temperature fell to normal, at first every night, then every second night, and lastly, twice a week, and under this treatment all his symptoms cleared up completely, the liver returning to almost its normal size. Judging by the acuteness of his symptoms on admission, this is a very striking case, and would, I feel almost sure

* Being a paper (with the Discussion) read at a meeting of the Medical Section of the Asiatic Society of Bengal—Ed., I M G

have gone on to the formation of a liver abscess had ipecacuanha not been used. I may add that his condition was very much more acute when admitted the second time.

Case No 2, with Chart—W W, male, *et* 25

For six weeks before admission this patient had been suffering from dysentery. He was admitted to hospital on 26th September 1907, for dysentery, and at the time of admission there were no signs of hepatitis, the liver being of normal size, no fever.

On 11th October he began to complain of pain over the liver, the dysentery in the meanwhile having completely stopped, and with this pain fever began. Temperature became of a remittent type, fluctuating between 99° in the morning to 102° or 103° in the evening, and with this he perspired a great deal at night, no rigors, slight icteric tinge of conjunctivæ. X-rays diaphragm fixed on the right side, moves freely on the left, no definite shadow to be seen in liver substance. At this stage the patient looked ill, and made one suspect liver abscess. In spite of fomentations, leeching, etc., and small doses of ipecacuanha, gr i, four times a day with calomel, the fever and pain continued. On 19th October thirty grains of ipecacuanha were given and repeated daily for the next seven days up to 27th October. With this his temperature fell to normal on the 20th October and with the exception of a slight evening rise on 20th and 22nd continued normal from that date onwards. Pain in the liver and shoulder completely disappeared, and he was discharged on 22nd November.

In this case the patient while actually under treatment for dysentery developed an acute hepatitis, so acute that one suspected that the hepatitis was going on to suppuration, and under treatment with ipecacuanha in large doses, the inflammation completely subsided and cleared up.

Case No 3, with Chart—J F A, male, *et* 30

This patient was admitted for continuous fever of one week's duration with jaundice and pain in the right hypochondrium, no rigors.

There was in this case no history of diarrhoea or dysentery, but his stools examined after admission were unhealthy and contained mucus. Liver dulness extends from 5th rib to 2 inches below C M in nipple line, very painful and great tenderness on palpation over the right lobe. Leucocytosis present.

X-rays—diaphragm movements restricted on the right side, no shadow to be seen in the liver substance.

He was admitted on 25th February 1907, and on 26th was given one dose, grains xv of ipecacuanha. On 27th, 28th and up to 3rd March two doses daily of 15 grains in each dose. His temperature gradually came down to normal and continued so except for a slight rise due to a little bronchial catarrh.

The liver was reduced to its normal size and the jaundice entirely disappeared.

Case No 4, with Chart—D S, male, *et* 33

About three weeks before admission patient had an attack of dysentery. This lasted for about 14 days. He was then well for three days when the dysentery returned, and has continued up to the time of his admission. In addition, for the last few days before admission patient has had a severe pain in the liver and right shoulder, both being greatly increased on taking a deep inspiration.

Liver considerably enlarged, extending 3 inches below C M in nipple line and very tender on palpation. Moderate degree of leucocytosis.

Polynuclear	79.2 per cent
Lymphocytes	12.4 "
Large mononuclear	5.6 "
Eosinophiles	3 "

With the X-rays no definite shadow was seen, diaphragm on right side absolutely fixed. From his Chart it will be seen that there was also a considerable degree of pyrexia, his temperature fluctuating between 101° and 103°. He was given grs xx of ipecacuanha on 7th September, and after that his temperature began to fall, but owing to the physical signs present, it was decided to explore his liver for pus.

His condition before aspiration was as follows—

(1) Right side obviously bulging more than the left.

(2) Liver enlarged, extending 3 inches below C M in nipple line.

(3) Area of great tenderness between the axillary lines all over lower part of right side of chest with a point of exquisite tenderness over a small area in 8th and 9th interspaces.

On the strength of the above physical signs plus the irregular temperature and leucocytosis, he was aspirated on 10th September and punctured in five places, no pus found.

On the 11th September, the temperature rose again slightly, and on 12th it continued above 100° all day, grs xx of ipecacuanha were given again that day. Temperature practically normal on 13th and 14th, rose again on 15th and 16th, ipecacuanha grs xx repeated on 17th twice and once on 18th, temperature fell to normal on 20th September, and continued so from that date. Pain entirely disappeared, and liver very much reduced in size. He was discharged on 1st October.

Case No 5, with Chart—P W, male, *et* 24

Patient had suffered from diarrhoea. No history of dysentery.

Liver extended from 4th space to 1½ inches below C M in nipple line, no tenderness.

Red corpus	4,668,000
White "	20,750

This patient had suffered from fever for 35 days, on which quinine had had no effect whatever. He was given 50 grains of ipecacuanha daily for three days. Fever subsided after three days of ipecacuanha treatment. In this case

there were no signs or symptoms pointing to hepatitis, in fact no obvious cause could be found for the fever, but the marked degree of leucocytosis made one suspicious of a latent hepatitis as has been pointed out by Major Rogers, and the ipecacuanha treatment was tried with most satisfactory results.

MEETING OF THE MEDICAL SECTION OF THE ASIATIC SOCIETY OF BENGAL

15th January 1908

Discussion on Captain J G Murray's papers on "The value of Ipecacuanha in the treatment of Tropical Hepatitis and the prevention of Liver Abscess."

Major L Rogers, *MS*, showed lantern slides of five additional cases of amoebic hepatitis treated by ipecacuanha. He divided them up into three classes. Firstly, cases with symptoms of dysentery and followed by acute hepatitis, which was illustrated by the first chart from a patient admitted for dysentery, who developed symptoms of acute hepatitis accompanied by fever and leucocytosis after the dysenteric ones had abated. The fever, which had lasted for 41 days, all within two days after large doses of ipecacuanha were given and the hepatitis also disappeared. Secondly, cases in which there were signs of acute hepatitis without a history or symptoms of dysentery, but accompanied by a marked leucocytosis, which was peculiar, in as much as the proportion of polymorphs rarely reached 80 per cent, as is usually the case with inflammatory conditions of bacillary origin. The charts of three such cases were shown, in which the fever, of from 14 to 20 days' duration, cleared up in three to five days under large doses of ipecacuanha. One of them showed a rapidly remitting temperature, accompanied by profuse sweats. The third class showed symptoms of neither dysentery or hepatitis, but in the case illustrated only persistent fever of 45 days' duration of unknown origin. Finding a leucocytosis, of the type mentioned, ipecacuanha was given and the temperature rapidly subsided.

The speaker next dealt with the explanation of these cases. He referred to his previous work, showing the presence of amoeba in some 40 consecutive cases of liver abscess, over two thirds of which were otherwise sterile on culture. Further, he had shown that when both a clinical history and a *post mortem* records were available in fatal cases of amoebic abscess of the liver, dysentery was noted in over 90 per cent, while in all his own cases this had been of the amoebic type. In nearly one fourth of the cases, however, both a history and symptoms of dysentery had been absent, although amoebic ulcers were found in the upper part of the large intestine after death from liver abscess—the disease having been of a latent nature. These observations led him to conclude that amoebic dysentery, often of a latent nature, always precedes amoebic abscess of the liver. While on the lookout for early cases of liver abscess for trying his method of aspiration and injection of quinine, to kill the amoeba, without drainage (which has proved a rapid means of curing some cases of small deep seated liver abscess, which are most difficult to open and drain), he observed that leucocytosis was not infrequently present in cases of acute hepatitis, in which repeated aspiration failed to lift off any abscess, the patients recovering for a time. When, however, they could be followed up, they nearly always had a liver abscess opened at a later date. Having come to the conclusion that these cases are always secondary to latent amoebic dysentery, and having observed, that ipecacuanha was of special value in this form of bowel disease, he commenced to treat all cases of acute hepatitis, even when there was no history or symptoms of dysentery, with large doses of ipecacuanha, with the result that case after case

rapidly lost their fever and acute symptoms, while the liver became reduced to the normal size, as in those now brought forward by Captain Murray and himself. It was well known that the development of liver abscess is nearly always preceded by prolonged fever, commonly treated as malarial, while such cases have commonly occurred in the General Hospital for many years past. During the last year, however, since the method of early diagnosis of amoebic hepatitis by the blood changes, and their prompt treatment with large doses of ipecacuanha had been regularly carried out, no abscess of the liver had developed in the hospital, although a few cases had been admitted with an abscess. By the systematic use of these methods it ought to be possible to prevent the vast majority of such cases in the future.

Lastly, he wished to point out that the conclusions he had come to were largely of the nature of a rediscovery. As early as 1783, Stephen Mathew recommended calomel and ipecacuanha pills, and emetic doses of the latter drug in hepatitis. The honor of introducing large doses of ipecacuanha, in the place of mercury, in the treatment of tropical hepatitis, however, appears to belong to McLean, who in his well known Netley lectures urges this treatment as a preventative of tropical abscess of the liver, while Murchison in 1885 refers to McLean's views, and records that it is a notable fact that since ipecacuanha has come into general use in the treatment of dysentery in India, abscess of the liver has become less frequent. The revival of the common use of this treatment, combined with the early diagnosis of amoebic hepatitis in the presupplicative stage by means of the blood changes described by the speaker, should lead to the prevention of the vast majority of tropical abscesses of this organ, and thus rid the tropics of one of its most formidable diseases.

Lieutenant Colonel G F A Harris, *MS*, remembered Dr McLern having advised large doses of ipecacuanha in both dysentery and hepatitis, and he himself had used this treatment successfully in Jhansi many years ago. He asked Major Rogers if he could explain the exact pathology of tropical hepatitis, and whether ipecacuanha should be given to produce vomiting as old writers advised, or with precautions to prevent its occurrence. He noted that in some of Dr Murray's cases repeated sweats occurred, and he suggested that in these empuation had already taken place. He had used ipecacuanha sine emetina with apparently good results in some cases.

Dr Arnold Caddy referred to the great differences of opinions as to the value of various drugs in the treatment of dysentery. He mentioned the composition of ipecacuanha and asked if its virtues depended on either of the alkaloids it contained on the gum or woody fibre which entered into its composition. In conjunction with Dr Kanthack he had obtained good results with ipecacuanha sine emetina. On the other hand, Tull Walsh had used emetine with mercury iodide, which Merk pointed out formed an insoluble compound, he thought opium was injurious in hepatitis, and asked if ipecacuanha could be given in any way without a preliminary dose of opium.

Major O'Kinealy spoke of his experience in the Midnapore jail, where he only found a record of one case of liver abscess in some 2,000 cases of dysentery, and asked if hepatitis was not more common in Europeans than in natives of India. He suggested that the explanation of the rarity of liver abscess in jails might be due to the prevalent form, there being the Shiga bacillary variety. He narrated a case of pelvic abscess which was found *post mortem* to have tracked down from the liver, which contained other abscesses without any signs in the bowel of dysentery, but the patient during life gave the history of a blow on the abdomen some time previously. He thought that there were several forms of liver abscess, which should be taken into account, and that dysentery was a disease with regard to which no hard and fast rule of treatment

by drugs could be laid down, each case required treatment on its own merits and, in his experience, the drug that suited one case did not always suit another.

Lieutenant Colonel Drury, I M S, asked, what is acute hepatitis? Had not an abscess begun to form when very acute symptoms of hepatitis were present, and could it not become arrested at this stage? He thought that the ipecacuanha treatment assisted this process. In some cases of dysentery ipecacuanha had a curative effect, in others it was very disappointing. If it acted best on amebic dysentery, these variable results might be explained.

Major L. Rogers, in reply to the questions which had been put to him, said, that the exact pathology of tropical hepatitis was a very difficult point, but he thought that some observations on the early stages of liver abscess which he had previously published threw some light on the question. He had been fortunate enough on two occasions to see numerous very minute abscesses in the liver containing living amebæ in one of which streptococci from a septic wound were also present. Sections showed that the suppuration actually began within the branches of the portal veins, and amebæ, some undergoing degeneration, were found in blood clots in these vessels, while a similar condition was observed in the walls of actively extending very acute abscesses of the liver. It was clear from this that the amebæ commonly reached the liver from the ulcerated bowel through the portal vein, but the difficulty was to explain how a single, or a very few, large tropical abscesses could thus arise. The suggestion he had put forward was, that while numbers of amebæ carried to the liver might produce symptoms of acute hepatitis, yet as long as they were widely scattered through its substance, they might be involved in small clots and degenerate without being able to escape from the vessels and start an abscess. If, however, a number happened to settle in one place and produce sufficient clothing to cut off the blood supply from a small portion of the liver, then a focal necrosis would result and allow the amebæ to escape from the vessels and form a minute abscess. This might then spread concentrically by fresh clothing and breaking down of successive portions as seen in active abscesses, until the reaction of the tissues led to the formation of the fibrous wall which always limits the more chronic amebic abscesses. He thought the ipecacuanha cured the acute hepatitis in the presuppurative stage by a specific action on the amebæ in the ulcerated large intestine, and so cut off the showers of amebæ through the portal vein, which caused the hepatitis, which would then subside if an abscess had not already formed. A small abscess might certainly encyst, several cases being on record in the Medical College post mortem registers, and he was inclined to agree that this might be more common than is now generally believed. With regard to the action of ipecacuanha, he thought the whole drug was more efficient than the sine emetina. The mode of its administration was very important. Chloral hydrate was an efficient substitute for opium as a preliminary measure to prevent vomiting, which should be avoided in order to allow of the drug reaching the large bowel. A still better method was one which he had recently adopted with very satisfactory results as a rule. That was to have the drug put up in five grain doses in keratinised capsules, which were not dissolved until they came into contact with the alkaline juices of the intestines. He agreed with Major O'Kinealy's suggestion that jail dysentery was nearly all of the bacillary variety, and this view had recently been confirmed by Captain Forster's researches in the Midnapore jail, while it accounted for the rarity of tropical liver abscess in Indian jails. There were, of course, several varieties of liver abscess, but the vast majority of large tropical abscesses clinically recognisable, were amebic in origin. Suppurative pyelophlebitis also occurred, but was rarely diagnosed with certainty during life. Another important variety, very rarely recognised

clinically, was suppuration in the bile ducts of the liver substances (suppurative cholangitis), which was almost always secondary to gall stones. He had diagnosed and operated on one such case in the European General Hospital when resident surgeon there.

Captain Murray in reply remarked that he had found the ipecacuanha treatment much more efficacious in most cases of dysentery at the General Hospital than the saline treatment. He thought that its comparative failure in jails and among native troops might depend on the difficulty of properly supervising this form of treatment so as to avoid vomiting under the conditions of work in those institutions.

CALCIUM CHLORIDE AND ITS ACTION ON THE COAGULABILITY OF BLOOD

By V B NESFIELD, F.R.C.S. (ENG.),

CAPTAIN, I M S.

Medical Officer, 27th Gurkha Rifles

It is an accepted fact, that small quantities of Calcium chloride increase the coagulability of the blood, and larger quantities decrease the coagulability.

Why the latter?

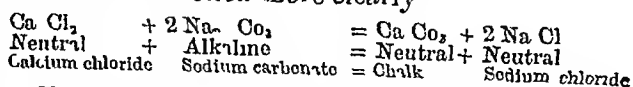
The reaction occurs *in vitro*, and so is not a biological action, unless of course, that comparatively large quantities of Calcium chloride prevent the breaking down of white corpuscles, but this is improbable.

Let it be taken, then, that the action is a purely chemical one, which most probably is the case. What then is the chemical reaction?

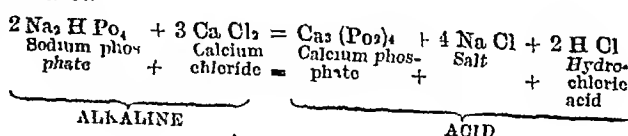
1. For fibrinogen to be capable of accepting a Calcium molecule from Fibrin ferment, and to clot, a certain degree of alkalinity is commonly acknowledged to be necessary. The supposed lessening of this alkalinity in scurvy, and the acute infectious diseases, is believed to be the cause of the decreased coagulability of the blood in these conditions. Also, it is essential for calcium to form a compound with nuclein, to make its union with fibrinogen possible. But, nuclein acts only as a very weak acid, and probably to form the combination with calcium suitable for coagulation, requires that no acid influence be present.

Experiment I

To a 1 per cent solution of Sodium carbonate add litmus, the solution is strongly alkaline. Add an excess of a neutral solution of Calcium chloride, the alkalinity is lost. Phenol phthalein shows this reaction more clearly.



To a 1 per cent solution of Sodium phosphate add litmus, and 1 drop of 2 per cent caustic soda to make distinctly alkaline. Add a neutral solution of Calcium Chloride, the blue colour changes to red, free Hydrochloric acid is formed.



ALKALINE

ACID

The alkalinity of the blood is due to Sodium phosphate and carbonate. The above two experiments show, how Ca Cl_2 is able, not only to neutralise this alkalinity, but to actually produce an acid.*

Moreover, they suggest a remedy, viz., the addition of Sodium carbonate.

The action then of an excess of Calcium chloride in reducing coagulability, may be due to the formation of acid, and the removal of alkali, sufficient to render coagulation unfavourable.

2 Calcium probably exists in the blood as the soluble bicarbonate, and most probably Na_2CO_3 does not exist as such, but as the Bicarbonate Na HCO_3 , as serum is not alkaline to Phenol phthalein. Therefore, on the addition of Calcium chloride there is no actual precipitation of Calcium carbonate, until the blood loses some of its CO_2 .

But Sodium bicarbonate by interacting with Calcium chloride to form Calcium bicarbonate, $2\text{Na HCO}_3 + \text{Ca Cl}_2 = 2\text{Na Cl} + \text{Ca (HCO}_3)_2$ prevents the interaction between Calcium chloride and Sodium phosphate, and hence, not till all the Sodium bicarbonate has been absorbed by Calcium chloride, does it attack the phosphates.

With blood then, a little Calcium chloride has no action on Sodium phosphate, but an excess removes phosphates from solution by precipitation as the insoluble Calcium phosphate. Hence an excess of Calcium chloride precipitates phosphates, and, this may be the cause of the reduced coagulability.

The addition of Barium chloride, which also precipitates phosphates, in the place of Calcium chloride, will help to prove this point.

Summary—An excess of Calcium chloride probably reduces the coagulability of the blood for one of two reasons—

- 1 By reducing the alkalinity of the blood
- 2 By precipitating phosphates

Probably phosphates are essential for coagulation, and, it is likely, that clinically Sodium citrate and Sodium phosphate will prove to be of value in combination with Calcium chloride (by mouth) for increasing the coagulability of the blood.

* * * * *

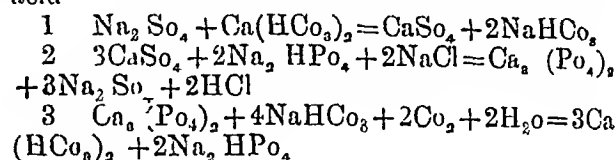
Rider—It is difficult to understand the physiological mechanism by which the glands of the stomach form Hydrochloric acid.

I would suggest the theory, that the Phosphates ingested with the food and drink and which appear in the body juices as the alkaline Phosphates of the general formula Na_2HPO_4 interact with soluble Calcium (and Magnesium?) Salts in the presence of Chlorides to form Hydrochloric acid.

* This is a little difficult to show with blood by Wright's method, possibly because the acid at once combines with the albumen.

The part played by the acid forming cells being fourfold—

- 1 The temporary fixation of Calcium
- 2 Its formation into Calcium sulphate
- 3 The formation of HCl from Calcium sulphate in the presence of Sodium phosphate and Chloride
- 4 The Solution of Calcium phosphate with the help of Sodium bicarbonate and Carbonic acid



ON A NEW TEST FOR DIFFERENTIATION OF THE BACILLI OF THE TYPHOID GROUP

By GOPAL CHUNDER CHATTERJEE, M.B. (CAL.),

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SINCE the discovery of Eberth Gaffky Bacillus as the cause of typhoid fever and its differential characters thoroughly worked out by Gaffky, several species of bacteria have been discovered which are very much allied to Eberth's bacillus. Some of these are the cause of fevers of the typhoid type, but the blood of the patients suffering from them does not react with typhoid bacillus. One type of these fevers is caused by Gartner's bacillus. Kurth and Scheimüller have separated another variety of bacillus which is the cause of a large number of fevers. These go by the name of Paratyphoid fevers. The bacillus is called the Paratyphoid bacillus. A variety of this bacillus has been found and the two are designated Paratyphoid A and Paratyphoid B. Besides these, several other bacteria have been recently discovered allied to typhoid bacillus. This necessitates the finding of a test for differentiating the several bacilli of the group.

Quite a number of observers have occupied themselves in finding out the distinctive characters of these bacilli, but it cannot be said that this problem has been solved.

Kutscher and Memcke undertook an extensive series of investigations to find out the distinguishing characters between different varieties of this group. For this purpose, they collected a large number of strains of each of the different varieties belonging to this group. They had 64 different strains of Paratyphoid B, 5 Paratyphoid A, 17 Enteroides and 21 Mouse typhoid bacilli. At first, they tried to find out any distinctive character from morphological grounds—

1 Staining—showed no distinctive shape and size of the bacilli in different varieties.

2 Movement—no distinctive characters could be found on this.

3 Cultural characters.

They tested altogether the culture media (agar, bouillon, litmus lactose agar, neutral red agar, litmus whey, glucose agar, Conrad's medium, glucose gelatine, Endo's medium, Barsikow's medium No 1, and No 2). They found that Paratyphoid B and mouse typhoid bacillus and meat poisoning bacillus, could not be separated from one another by cultural tests alone. These can be easily separated from Paratyphoid A, by the above cultural tests. They found that Conrad's medium, glucose agar, Barsikow's medium and Roth-bergers neutral red agar, though they are of much help in separating some of the bacilli, do not present distinctive characters for each variety of the bacilli.

They then examined the bacilli by agglutinating and specific bactericidal reactions. For this purpose they

had 23 varieties of immunising sera from different varieties of bacilli, 10 Paratyphoid B, 2 Mousetyphoid, 9 Typhoid, 1 Enterides, 1 Paratyphoid and 29 Control sera (of Cholera and Staphylococci). They then tested all these sera with their own bacilli (1) and then each bacillus with normal salt solution (2) and then each bacillus with different sera (3) and with the different control sera. As the result of numerous examinations, they came to the following conclusions —

1 Paratyphoid B and Enterides Bacilli are nearly allied regarding agglutination tests

2 Typhoid serum can agglutinate all Paratyphoid B bacilli

3 Mousetyphoid bacillus reacts with Paratyphoid B Sera up to the highest dilution and also showed distinct reaction with Enterides Sera. It also showed distinct reaction with typhoid and paratyphoid sera.

Regarding bacteriolysis, they found that bacteriolytic sera can be of help in distinguishing Paratyphoid A, Mousetyphoid and Enterides No. II Paratyphoid B, Mousetyphoid, and Enterides I bacilli can be separated from each other by the test, but Typhoid and Enterides II show similar reactions.

Therefore, no characters can be said to possess distinctive characters for each variety of the bacilli belonging to the group.

Leo Zupnik tried to find out the differentiating characters of the several varieties of bacilli belonging to the typhoid group, especially between varieties Paratyphoid and Eberth's bacillus. In searching for a distinctive cultural test, he found that dulcete can separate Schottmuller's bacillus from Brion Kayser's bacillus. Regarding Petruschky's litmus whey, it may also serve the same purpose. One per cent Erythrite in litmus agar is decolorized by Schottmuller's bacillus but Brion Kayser's bacillus produces no change. As regards agglutination test, he concludes as the result of numerous investigations with several varieties of paratyphoid and typhoid bacilli with several varieties of immune sera that each variety of bacillus may react to sera belonging to other varieties, but with its serum it is specifically reacted in much higher dilutions than can be obtained with other bacilli. In this way all the varieties can be separated from each other.

Kelle tested 106 different strains of Paratyphoid bacillus for finding out distinctive cultural and biological tests for bacilli belonging to the typhoid group. As the result of his investigation he came to the conclusion that the receptive apparatus of Eberth's bacillus being similar to that of Paratyphoid serum of typhoid bacillus agglutinates Paratyphoid bacillus. In order to make agglutinating reaction of diagnostic worth, the following precaution should be taken —

1 Agglutination must be made by a serum of high agglutinative power

2 Macroscopic method should be used

But in spite of these precautions he found a good number of exceptions. A Mousetyphoid serum has been known to agglutinate Paratyphoid bacillus, while it failed to react on true mouse typhoid bacillus. An Enterides bacillus which does not react to Paratyphoid serum may react to typhoid serum, like true typhoid bacillus, but it can be easily separated from typhoid bacillus by fermentation and other cultural tests. No amount of positive reaction by a serum can be of diagnostic worth for a typhoid bacillus unless the bacillus gives all the cultural tests of typhoid bacillus. Nor can the absence of agglutination reaction warrant one in asserting that a particular bacillus is not typhoid, as some bacilli, especially those which are recently separated from the human body, do not react readily for some unknown reason. On these grounds he came to the conclusion that for separation and determination of a bacillus belonging to this group, both cultural and biological tests are necessary and that agglutination test is not a group reaction as asserted by Zupnik, but that it is specific for each variety of bacillus with certain limitations.

Pribram tried to find out by an extensive series of experiments the characters by which the typhoid bacilli can be absolutely separated from other bacilli of the group and tried to find out whether these characters, if there be any, are common to a large number of different strains of typhoid bacillus and whether there are any subvarieties of Eberth's typhoid bacillus. For this purpose he collected 47 strains of typhoid bacillus from different cases of true typhoid fever. By numerous cultural and biological tests he came to the conclusion that there are no subvarieties of typhoid bacillus.

Then he tried to find out the differential characters of the typhoid bacillus. The following is a summary of his experiments —

He tested his 47 strains of typhoid bacillus with the following tests —

1 Barsiekow's medium with nutrose and serum with different varieties of carbohydrates. The 47 strains showed individual variations in the power of clotting and decomposing carbohydrates.

2 Potato — Some of the strains showed typhoid like growth, some coli type growth.

3 Litmus Milk — All the strains changed it to acid but none showed clotting. This is common to all.

4 Rothberger's test

5 Kashinda agar

6 Endo's medium

7 Conrad's medium

8 Fitzgerald — Dhayer's medium

9 Braun's Protein — Ochrom reaction common to 39

10 Kitasato's Indol reaction

11 Gelatine

12 Petruschky's litmus whey

13 Erythrite agar

All these showed slight individual variations.

So that it seemed that by those characters which were found common to all the strains, typhoid bacillus could be separated from allied bacilli of the group. But during the course of the investigation a set of new bacilli was discovered which cause Epizootic diseases among the lower animals. These bacilli gave all the reactions similar to typhoid and when all the above tests were applied, no distinguishing character was found by which these bacilli could be differentiated from typhoid bacillus. When these were tested by agglutination test, it was found that serum reaction is common to the whole class, and not specific for each variety of the bacilli, though he stated that for practical purposes high agglutinative reaction coupled with some selected cultural tests will serve the purpose.

Recently Buchholz has described an ingenious method of differentiation of the bacilli of this group by using Oldekop's agar as culture medium to which different colouring matters (as Malachite green, Orceine, neutral red litmus) are added, the several bacilli of this group are found to react differently to the several coloring matters, some decolorizing one or two or three of the colors. By this means, the several bacilli belonging to this group are differentiated. He examined altogether 40 different strains of typhoid, 28 Paratyphoid B, 7 Paratyphoid A, 2 Mousetyphoid, 9 Gartner's bacillus (Nos I and II), Dysentery Bacillus (Shiga Krause) and a large number of Coli bacilli. He found the different characters constant for each variety of bacillus, but this test has its limitation. Paratyphoid B, Mousetyphoid and Bacillus Enterides Gartner cannot be separated from each other by the test. They are found to give same reactions.

Working along this line, I came across a test which has been applied with advantage in the solution of this difficult problem and has given uniformly satisfactory results. It is known for a long time that bacteria growing in any culture medium produces a toxine in it which after a time prevents the further growth of the bacillus — that it is not due to exhaustion of the nutrient stuff can be proved by heating the medium which destroys the toxine and inoculating again with the same bacillus which will readily grow in it. The

toxine however does not kill the bacilli even after a long time. They remain in a dormant state, so that if a loopful be taken from a culture medium in which the bacilli have ceased to grow and inoculated into a fresh culture medium, it will grow vigorously in it. It has been also known that this toxine has got a specific action on its own bacillus—so that while preventing its growth, it will allow other bacilli to grow in it. Advantage can be taken of this property of the toxine in differentiating allied bacilli which culturally show same reactions. For this purpose I took a number of ordinary agar slants and inoculated them with typhoid bacilli—the whole surface being smeared with them. After a certain number of days growth at 37°C the surfaces of the agar slants were scraped and washed with sterile salt solutions and the growth removed from the surfaces as much as possible. If this scraped surface be inoculated with typhoid bacillus, no bacilli will be found to develop in it, but if *Coli* or Paratyphoid or any other bacillus be inoculated, then there will be seen a growth on about the third day. It therefore stands to reason that the question whether an unknown bacillus is or is not a typhoid bacillus, can be easily settled by inoculating the bacillus on a typhoid scraped agar surface as described above. If the bacillus fail to grow in it, then it ought to be, according to the above theory, a typhoid bacillus. If it grow on the scraped surface, then it is not. It requires to be seen how it comes out in actual experiments. For this purpose I undertook to investigate the bacilli of the typhoid group specially as the several bacilli belonging to this group are allied to each other in several cultural and biological characters, and as also on account of the importance of this bacilli of this group, numerous observers have worked on this subject, a short résumé of a few of the recent works on the subject have been given in this beginning.

The bacilli which are the subjects of investigation are the following—

1 Typhoid bacillus from Kral Laboratory in 1901 and has been used for testing innumerable specimens of blood of suspected typhoid cases from Medical College Hospital with satisfactory results (No I)

2 Another strain of typhoid got in 1907 from the same Laboratory giving all the cultural characters of typhoid but found to give partial spontaneous clumping to all kinds of blood, be it typhoid or not (No II)

3 One Shiga's Dysentery bacilli

4 One Flexner's Dysentery bacilli

5 Paratyphoid B got in 1904

6 Paratyphoid B got in 1907

7 Two *Coli* communis (No I & No II)

The bacilli were tested by cultural tests and were found to give all the ordinary tests employed for this purpose.

Then, a series of agar slants were inoculated with typhoid bacilli—the whole surface being inoculated and then incubated for three days at 37°C. On the fourth day, sterile normal solution was added to each of the tubes, and the cultures were detached from the surface of the agar by shaking and also by gently scraping with a platinum needle, care being taken that the surfaces were not scratched, then, the liquid contents with the suspended bacilli were poured out and the tubes incubated at 37°C for 24 hours. If at the end of this time the surface of the agar was found to be free from any visible growth (as is always the case), one half of the agar surface was inoculated with 24 hours culture of typhoid and the other half with Paratyphoid B. After 24 hours' incubation no growth was found as a rule on either half. On the second day or, better, on the third day the typhoid inoculated portion was found to be free from any growth, while the paratyphoid portion showed a thin growth. Experiments were made similarly with *Coli* Paratyphoid A, Flexner and Shiga's Dysentery bacillus, the result is given below—

Tables showing the result of inoculation of different bacilli on the typhoid scraped agar—one half of the

surface being used as control, being inoculated with typhoid, and the other half with different bacilli—the tubes being examined on the third day of inoculation.

Typhoid Scraped Agar

Name of the bacillus with which one half is inoculated	Control half inoc. with typhoid control half	The other half inoculated with bacilli mentioned in column I
Paratyphoid A	No growth	Thin growth
Paratyphoid B (1904)	Do	Do
Gartner's bacilli	Do	Do
Paratyphoid B (1907)	Do	Do
Shiga's bacilli	Do	Do
Flexner's bacilli	Do	Do
<i>Coli</i>	Do	Do

Another series of typhoid scraped agar slants prepared in the above manner were inoculated transversely to the length of the tubes with the following bacilli in each tube, in the following order, one below the other, as shown in the diagram, there was left intervening an uninoculated layer between two inoculated regions on the third day, there was found a fine growth over all the inoculated portions except over the typhoid regions where no visible growth was found. Then, another series of typhoid scraped agar slants were inoculated in the following order—

Coli
Typhoid
Gartner's bacilli
Paratyphoid B

On the third day, *Coli*, Gartner bacilli and Paratyphoid B inoculated portion show thin growth, but there was no growth in the typhoid inoculated portion.

Several experiments were made in this way with different combinations of bacilli, and in different arrangements, they gave the same result always, i.e., there was no growth over the typhoid inoculated portion, but other portions showed a growth.

Four agar slants were inoculated with typhoid bacilli and four other tubes with *Coli* bacilli no distinguishing marks were put on the tubes, and they were mixed together, so that it was not possible to say which tube was typhoid and which was *Coli* by merely looking at them. These tubes were then marked consecutively from No 1 to No 8. Eight typhoid scraped agar tubes were made, and each of these was inoculated on one half of the agar slants from each of the former tubes marked Nos 1 to 8, the other half of the scraped agar slants being inoculated with typhoid bacillus. After three days' incubation, it was found that the agar slants inoculated from Nos 3, 4, 6 and 7 showed no growth in either halves of the tubes and the corresponding culture were tested by fermentation test. They showed no gas formation showing that they were typhoid. The rest of the tubes showed a growth on one half of the slants and corresponding cultures were tested and they were found to be *Coli*.

This experiment was repeated several times with the same result.

The above series of experiments prove conclusively that a specific toxine is secreted by a bacillus when grown in a culture medium. This prevents further growth of the bacillus of which it is this toxine, but will allow other bacilli to grow in it. This toxine is best developed in case of typhoid about the third or fourth day. For it has been found that if an agar slant be inoculated with typhoid bacillus and be scraped on the second day, a thin growth will be seen to develop after 24 hours' incubation. The toxine is thermolabile and is destroyed by heating at 50°C for half an hour as can be proved by the following experiment. One half of a typhoid scraped agar is inoculated with typhoid and the other half with some other bacillus, no growth is found on the typhoid

half, but a good growth in the other half is seen. The tube then heated to 55°C for half an hour and then cooled and is inoculated over the typhoid half with typhoid bacillus, the next day a thin growth is found on the typhoid half.

Another typhoid scraped agar slant is inoculated transversely to the length of the tube with color typhoid and Gartner's bacilli, no growth is found over the typhoid portion, but there is growth over the rest of the inoculated portions. The tube was heated to 50°C for half an hour. A fine growth is found over the typhoid portion after 24 hours incubation.

Similar experiments were made with scraped agar over which had been grown Paratyphoid B Shiga bacillus, Krause's bacillus, etc., the results are given below —

Therefore it can be concluded from the above that typhoid bacillus excretes a thermolabile specific toxine in the culture medium in which it is grown and that it has got a restraining influence on the growth of the typhoid bacillus but not on other bacillus, and that this specific property of the toxine can be utilised in the identification of an unknown bacillus, this was put to a practical test in identification of a bacillus separated from the blood of a typhoid suspected case. This bacillus gave all the cultural tests of typhoid bacillus, but no definite opinion could be given as to whether the bacillus is typhoid or not till the agglutination test is applied. As the anti typhoid serum was not ready, the bacillus was inoculated over one half surface of a typhoid scraped agar, and the other half was inoculated with typhoid. No growth was found after 5 days incubation. The

Table showing the result of inoculation of several bacilli of the typhoid group on scraped agar

Bacillus with which agar is grown and then scraped	Control half of the scraped agar inoculated with its own bacillus	The other half of the scraped agar inoculated with different bacilli examined after 72 hours incubation				
Typhoid, 1901	<i>Nil</i>	Typhoid, 1907 Sometimes there is an indistinct growth, some times none	Paratyphoid A +	Gartner's Bacillus +	Colon Bacillus +	
Typhoid, 1907	<i>Nil</i>	Typhoid, 1901 Sometimes there is an indistinct growth, some times none	Paratyphoid B II +	Colon Bacillus +		
L Bacillus	<i>Nil</i>	Typhoid, 1901	Typhoid, 1907 —	Colon Bacillus +		
Paratyphoid B II	<i>Nil</i>	Paratyphoid A Sometimes growth, some times none	Gartner's Bacillus +	Typhoid, 1907 +	Colon. +	Paratyphoid B Sometimes growth, sometimes none
Paratyphoid A	<i>Nil</i>	Krause's Bacillus +	Paratyphoid B II +			
Gartner's Bacillus	<i>Nil</i>	Paratyphoid B No II +				

In the above table — sign indicates no growth, + indicates a growth. It will be seen that in 1901 typhoid scraped agar, there was sometimes a growth of Typhoid, 1907, sometimes, similarly in 1907 Typhoid scraped agar, the growth of Typhoid 1901, showed the same phenomenon, as indicating that while the two strains of the typhoid bacilli closely resemble each other though there is a slight difference in their toxins.

A little difference was noticed in experimenting with Coli scraped agar. Typhoid bacillus was found out to show any sign of growth in Coli scraped agar surface, so also Paratyphoid B. But when Comma bacillus was inoculated, it was found to grow, the various differences with different combinations of bacilli are shown below.

It seems that Coli Bacilli produces a powerful non-specific toxine which prevents the growth not only of Coli but of other bacilli as well.

tube was then heated to 50°C for half an hour and then inoculated with the new bacillus. This time there was found a thin growth. Another series of agar tubes were inoculated with the new bacillus, and after three days scraped, and then one of the tubes was inoculated with typhoid on one half of the tube, the other being used as a control, a second tube with Coli and a third one with Paratyphoid B, the Coli and Paratyphoid portions showed a growth but not the typhoid. This bacillus was afterwards tested with anti typhoid serum got from an immune rabbit and found to react to 1 in 6000.

In using this test for determining as to whether the bacillus is typhoid or not, the following procedure should be adopted — Several agar tubes are to be inoculated with a known strain of typhoid bacillus and another set of tubes to be inoculated with the bacillus to be identified (for convenience it is called L bacillus), then, on the third day the agar surface are to be freed

Table showing result of inoculation on scraped agar

Bacillus with which agar is grown and then scraped	Control half	The other half inoculated with different bacilli examined after 72 hours incubation		
Colon Bacilli	<i>Nil</i>	Typhoid <i>Nil</i>	Paratyphoid B <i>Nil</i>	Comma Bacilli growth
Typhoid	<i>Nil</i>		Colon growth	Comma growth
Paratyphoid B	<i>Nil</i>	Typhoid growth	Colon growth	Comma growth
Comma Bacilli	<i>Nil</i>	Colon growth	Typhoid growth	

from growth by scraping and washing with sterile salt solution. After 24 hours drying in the incubator, one half of the surfaces is to be inoculated with typhoid bacillus and the other half with *L. bacillus*. In the same way *L. bacillus* scraped agar is to be inoculated, one-half with typhoid and the other half with *L. bacillus*. After three days incubation, the tubes are to be examined.

The following possibilities can occur —

I. The typhoid scraped agar may show no growth over the control half but a good growth over the *L. bacillus* inoculated portion and in the *L. bacillus* scraped agar may show a good growth over the typhoid inoculated region but none over the control region.

II. In the typhoid scraped agar there may be no growth over the control (typhoid) half and also none over the *L. bacillus* inoculated region, and in the *L. bacillus* scraped agar no growth on either half.

III. There may be no growth in the typhoid (control) region in the typhoid scraped agar and also none over the *L. bacillus* inoculated region, but in the *B. bacillus* scraped agar there may be good growth over the typhoid region but none over the control region.

In the first case, it can be definitely stated that the bacillus is not typhoid, in case of the second alternative the bacillus is typhoid, in the third case, the bacillus is not typhoid but probably belonging to the typhoid group.

In examining a scraped agar slant, inoculated with a bacillus, for determining whether there is a growth or not, it will not do to simply look at the tube with the naked eye, for the uneven surface of the scraped agar (due to the remains of slight growth of the old culture) do not allow to easily make out whether there is a growth. The tube must be examined from the back of the agar surface by a magnifying lens. Often the whole length of the inoculated portion is occupied by a deposition of crystals which look like growth, but on careful examination will be found to be not so.

Summary —

1. *Bacillus* growing in culture media, as agar, produces a specific toxine.
2. The toxine is destroyed by keeping it for half an hour at 50° C.
3. It is not soluble in salt solution.
4. Typhoid bacillus also produces a toxine best developed on the 3rd or 4th day.
5. This toxine will prevent the growth of typhoid bacillus, but has no action on other bacilli.
6. By the help of this toxine typhoid bacilli can be easily identified.
7. Taking into account every way by which this test can be applied and its absolute specificity, use of complicated and innumerable culture media employed for differentiation and identification of typhoid bacillus becomes unnecessary.

A Mirror of Hospital Practice.

SPIROCHÆTE FEVER

BY W. H. KERNICK, D.T.M.,

CAPTAIN, I.M.S.,

Civil Surgeon, Raipur, C.P.

WHETHER cases of fever associated with the presence of *Spirochætes* in the blood should all be considered to be cases of relapsing fever is open to question.

The cases which came under my notice at the Saugor Jail in the latter part of 1907, were practically identical in symptoms with those

described as African Tick Fever, relapses were the exception, and there was nothing of an infectious or epidemic character.

These cases were returned as malarial fever, and beyond the presence of the *Spirochæte*, instead of the malaria parasite, in the blood, and the inability of quinine to modify the course of the fever, there was nothing to distinguish them from a somewhat prolonged paroxysm of quartan infection.

Nearly 50 per cent of the fevers occurring in the Jail during this period were of this nature.

Thus the returns of the Jail sickness during the year will show just twice the amount of malaria as it really existed. It is only by a very careful blood examination, made at an opportune moment, that an error in this respect can be avoided. The peculiarity of the fever was, that it only showed itself in those prisoners occupying a particular barrack.

Solitary cases, seven in all, occurred at irregular intervals of three days to three weeks during the months of August, September and October, the remaining cases of fever among the occupants of this particular barrack, and the cases of fever among men in other barracks, showed in all those in which the blood was examined the presence of malaria parasites, and were undoubtedly true malaria.

The endemic index of the Jail precincts was very low, not more than two cases of enlarged spleen being found among twenty children, while an examination of their blood proved negative in every case.

It is probable that many fevers, ascribed to malaria, occurring in jails, schools, orphanages, etc., in not particularly malarious places, are really due to *Spirochætes*, and that there is thus a very large margin of error in the returns showing the prevalence of the former disease in such institutions.

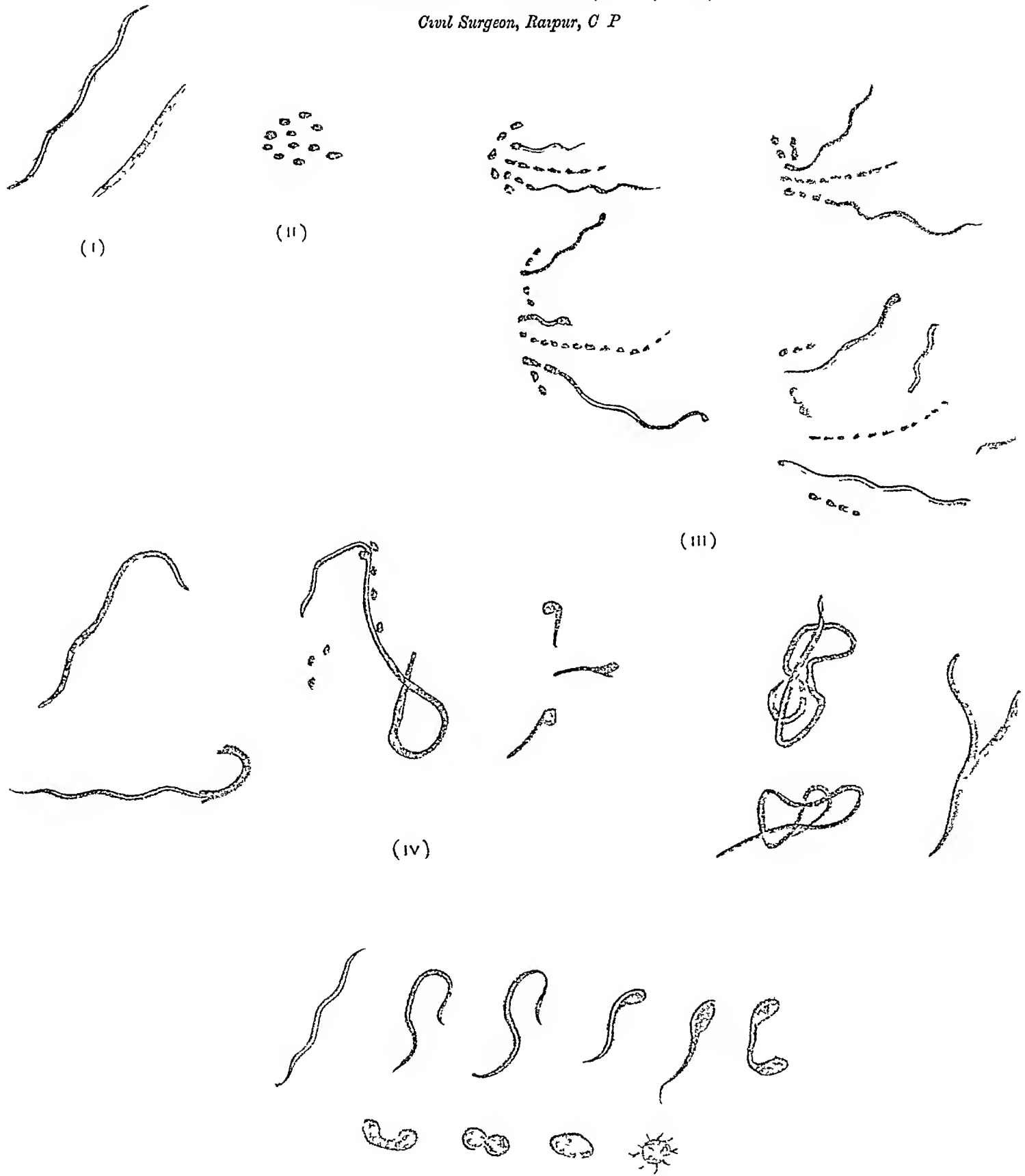
Dry films of the blood of one of these cases of *Spirochæte* fever were sent to Kasauli, and the parasites present were declared to be typical specimens of *Spirochæta obermeieri*. While examining live specimens in fresh films, I observed changes, probably of a reproductive character, taking place in certain of the parasites.

The central core of certain of the elongated slowly-moving forms became broken up into a number of round spore-like bodies, arranged regularly one behind the other throughout the length of the parasite (fig. 1), suddenly the enclosing sheath burst, and the spores became loosely grouped together in a round mass, free in the plasma (fig. 2).

Then, delicate wavy filaments became extended from some of the spores, the remainder arranging themselves in two or three lines on either side of and between the filaments, the latter which gradually increased in length kept up a continuous active movement or flagellation, their free ends became slightly thickened, and one by one they broke free, and progressing by

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BY CAPTAIN W H KENRICK, DTM, IMS,
Civil Surgeon, Raipur, C P



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slow undulatory movements were lost among the red corpuscles. The residual mass consisted of a few of the spores, arranged both irregularly and in one or two thin wavy lines (fig 3). Stained (Romanowsky) films of the same case of fever showed typical *Spirochaetes*, long forms, involution forms and sporulating (?) forms, the last named being of two kinds, one faintly stained, in which the central core in part of the parasite showed well-marked dark and light bands, some of these dark bands, especially near the free end, showing a certain rounding off into spore-like bodies, while the other kind, probably further advanced in the process, were for half their length, very deeply and uniformly stained, the other half consisting of a mere empty sheath, faintly stained. Lying outside, but in contact with this sheath at various places, were several free spores, these latter being as deeply stained and of apparently similar consistence, to the central core in the other half of the parasite (fig 4).

Numbers of small spores were also seen free in the field. Some of the stained parasites were seen to be partly twisted into skein-like forms, while others had the appearance of having split longitudinally.

The films in this case were taken during the decline of the fever, (temp 104° F), four hours after the acme (105° F), and seven hours after its onset.

That the *Spirochaete*, under conditions unfavourable to its survival, can become a more or less resisting, encysted form, I was able to observe in a fresh blood specimen, some hours after it had been taken.

The slow undulatory movements became faster and lashing in character, then, while the parasite became rapidly shorter in length, first one and then the other became thickened and rounded (fig 5). These two rounded ends appeared to coalesce and a slightly elongated spherical body resulted, this became round and stationary, while its surface became covered with minute flagella-like projections.

There were unmistakable peritrichal flagella in many of the living specimens, this condition has been observed by Zettnow and Boirel, while Bierni and others have demonstrated its absence.

The conclusion is that besides the varieties, *Spirochaeta obermeieri* and *Spirochaeta duttoni*, the causes respectively of Relapsing and African Tick fever, there are other varieties differing slightly morphologically, and that there is a process of reproduction by sporulation as well as by fission.

SURGICAL ASEPSIS IN ITS SIMPLER FORMS

By ERNEST F. NEVE, M.D., F.R.C.S.

In the Kashmir Mission Hospital, where we have to deal with a very large number of opera-

tions, sometimes over thirty in one day, it is essential to adopt methods which, while efficient, are as simple as possible. On a busy day we may be called upon to do half a dozen aseptic major operations, three or four cataracts, two or three septic necrosis of bone cases, fifteen or twenty entropions, and two or three hæmorrhoid cases. Thus we have a mixture of septic and aseptic and of major and minor operations.

Modern aseptic surgery is just as much antiseptic surgery as the original Listerian practice from which it has evolved. It is a war against sepsis. As in military matters it is the man behind the gun who is of primary importance, so is it in surgery. No method, however elaborate or theoretically complete, is reliable unless it be applied intelligently, conscientiously, with patience, and I think I may add with faith. Given that thoroughness and care, then the simpler the methods the better.

Where much of the work has to devolve upon Indian subordinates, these facts must be emphasised. Our antiseptic measures form a chain. In my experience the weakest link in that chain is the cleaning of the patient's skin prior to operation. In the Mission Hospital we have two operation rooms, two rooms in which preliminary cleaning is done and two special assistants for this work. One operation room, one lavatory and one assistant are reserved for aseptic cases. The thoroughness with which the cleaning is done is far more important than the exact method employed. The assistant, after first rendering his own hands aseptic, washes the operation site and surrounding area with soap and water, then with turpentine, followed by 1—20 carbolic lotion. This is followed by 1—500 biniodide of mercury spirit lotion of the following formula: Mercuric iodide 1 grain, Iodide of potassium 12 grains and spirit 1 ounce. In aseptic cases, first the site of the incision is cleansed and the washing is carried on centrifugally. In septic cases the instructions are to begin at the periphery and work centripetally, the centre being the point of maximum sepsis.

The above method sounds severe, but experience shows that the average skin stands it well. In the case of more sensitive skins, and certainly of Europeans, we find it wiser to use the turpentine sparingly. If a pad is left on the operation site, it should be of carbolic acid 1—60 or biniodide of mercury 1—2,000 in sterilized lint and never salalembroth wool, the salt of which, in a moist dressing, is apt to dissolve out and become concentrated and irritating. Wet carbolic pads are never placed on the hands or feet on account of the special risk of gangrene. The next weakest link in the antiseptic chain is the hands of operator and assistant. The latter wears strong rubber gloves, which are sterilized by boiling.

What is the actual range of usefulness of gloves for the operator? I always wear rubber

fingerstalls in operating on piles and fistula to protect my fingers from gross sepsis. We have also gloves available for septic cases. These are cleaned in 1—20 carbolic lotion after use and are then boiled. They are not used for bone cases as the risk of puncture is too great. For many aseptic operations, especially abdominal cases or where a large joint is opened I wear gloves, but not in perina operations as I use MacEwan's needle and do not slit up the ext abd ring. The finger which is passed into the ring canal must be again specially cleansed immediately before introduction.

The method of hand cleaning which we employ is—(1) Running water and soap (2) Prolonged washing in 1—100 Lysol, which is alkaline penetrating and not sticky and which also has the great advantage of not making the hands rough or proving too irritating, a *sine quâ non* where operations are very numerous (3) The hands, arms, fingers and nails are rubbed with 1—500 biniodide of mercury spirit lotion (4) This is rinsed off with the Lysol solution, or in the case of abdominal operations, with saline solution.

The instruments, sponge cloths, swabs, etc., are boiled in a fish kettle over a Rippengale oil stove. Every day at 12-30, the hour of our out-patient clinic, a set of instruments (*viz*, those known by experience to be usually required) is sterilized. But knives, to preserve their temper, are placed in 1—20 carbolic lotion. Any unsterilized instrument required during operation is first placed in pure liquefied carbolic acid.

Most minor operations can be proceeded with at once after the skin has been cleansed. Elaborate preparations are unnecessary. A careful surgeon, even with aseptic hands will aim at finishing the operation without touching the actual wound with his fingers at all. It is a great advantage for a wound to be touched by nothing which has not been boiled. The danger of trailing suture threads is great. While passing the needle it is well to have the end of the thread placed on the back of the left hand, previously dipped in lotion.

The more important operations entail absolute isolation of the wound from all sources of possible contamination. For this purpose we use sterilized towels and wear sterilized clothing, including cap. The operator should not talk. If he must, he will be wiser if he wears a mask. This can be easily made by tying a string to the upper corners of a strip of cyanide gauze 1 ft by 9 in. The strings are brought round over the ears and tied behind the head. The upper edge of the gauze rest on the bridge of the nose.

The selection and preparation of sutures and ligature material is a matter of importance. After trying a variety of methods we have settled down for the present to silk twist made

from the raw silk which we obtain from the local silk factory. This we have twisted into four, twelve, or eighteen ply according to the strength or fineness required. It is then boiled. After this it is dyed with Carbolic Thionin and again boiled and stored in 1—10 carbolic glycerine. Catgut we get out from Messrs Down Bros, in hanks of dry chromic strands. These we store in 1—10 carbolic glycerine.

In aseptic cases the less drainage that is done the better. Quick operations with very little handling, no bruising and no strong lotions in the wound, and careful toilet with the maintenance of even pressure till the dressing is applied, are the most successful from an anti-septic standpoint. Even in the treatment of small abscesses, if the walls are thoroughly cleansed and pressure is applied, drainage may be avoided. In large abscesses too we sometimes succeed. In abscesses connected with bone but with an unbroken skin surface my usual method is to evacuate, but not introduce a finger or instrument, as bleeding is so apt to follow and fill the cavity with clot. After evacuation the wound is sutured without drainage. About the fifth day if pus is again collecting, the original wound is opened up, and a drainage tube inserted. This is not always necessary.

For the dressing of aseptic cases we use Lister's Double Cyanide gauze, damp with 1—20 carbolic acid. As Kashmiri patients are apt to try to finger their wounds, I frequently put on a little Tr Benzoin Co. This, in drying, forms with the gauze a stiff splint-like dressing which hermetically seals the wound. Over this we use salalembroth wool, and if support is required or discharge is expected, sterilized sawdust bags.

It is impossible to carry on surgical work safely and conveniently without a sterilizer for the clothing used at operations—towels, coats, aprons, caps, cotton wool, in fact, everything which it is inconvenient to boil. We use a Holborn high pressure steam sterilizer working at a temperature of 250°F under a pressure of 15 lbs. It is heated by a large petroleum lamp. The sterilizer holds two large circular Schimmelbush kettles which have ample space for the clothing required for several operations. The cost of a large-sized sterilizer of this kind is about £35. We have to use ours about twice a week and at the same time we sterilize a large number of muslin bags of various sizes filled with sawdust. These form a most useful addition to our dressings, being aseptic, absorbent and cheap and in many cases obviating the necessity of putting on splints.

In this way our surgical work is made as simple as possible and asepsis is secured as long as *and only so long as* a constant watch is kept on every link of the chain to see that its full strength is maintained.

Indian Medical Gazette.

APRIL, 1908

"MEDICAL EDUCATION IN INDIA"

UNDER this title Colonel Kenneth Macleod, M D LL D, I.M.S. (retired), Honorary Physician to the King, continues an interesting series of reminiscences of his life and work in India, which is worth summarising in this place.

We may pass over the account of the ancient systems of medicine, the earliest record of which, the Ayur Veda, is supposed to have been compiled some 600 years B C. Though this system enjoys a degree of popularity and is still professedly followed by men who have been educated for better things, it must still be classed as containing the "crudest elements of science or the most irrational substitutes for it." Next came the Yunani or Arabian system of medicine, founded on the knowledge of Greece and Egypt. These systems, though interesting to the historical student or the antiquarian, have little or no practical value at present, and we need not concern ourselves further with them.

The earliest attempt to found a school in India for the teaching of modern medicine and science was in 1822 when it was proposed to found in Calcutta a school called the Native Medical Institution. As has been shown by the articles in the *Indian Medical Gazette* (January 1903), hospitals had been founded very early in the British occupation, but these were mainly for the use of the Company's soldiers and sailors, and in them a class of "native doctors" (a title only now becoming disused) had grown up, whom it was found desirable to teach more thoroughly so that a better stamp of native subordinate should be available.

At this time the needs of the population at large were practically entirely provided for by indigenous practitioners of several sorts and conditions, e.g., *Bairis* and *Kavirajes* and Mahomedan *Hakims*. Surgery as in other countries was left to the barbers, and midwifery to the *dhars*, and there existed a class of quacks who practised incantations and cast out evil spirits—a race by no means yet extinct in country villages in India.

This Native Medical Institution began work in 1824 and continued in existence till 1835, and during that time it supplied to the public service 204 Native doctors. The teaching was by no means bad, and the first Superintendents

were Drs Jameson, Breton and Tytler. In 1826 the Madras Government proposed a similar institution, but the next important advance was initiated by that wise Governor-General, Lord William Bentinck, who appointed in 1833 a Committee consisting of Surgeon J. Grant, Assistant-Surgeon Spens of the Bodyguard, Assistant-Surgeon Bramley, with Babu Ram Comul Ser and two European civilians. They reported within a year and an order of Government was issued in January 1835 constituting the Calcutta Medical College. Assistant-Surgeon M J Bramley was appointed Superintendent, H H Goodeve, assistant, with Pundit Mudusudun Gupta and two native Assistants. Sir Wm O'Shaughnessy was afterwards appointed. Work began towards the end of 1835 and the regular dissection of the human body commenced by "Mudusudun Gupta and a few courageous pupils who rose superior to the prejudices of their earlier education." An act so vital in its consequence is still commemorated by a portrait of Mudusudun Gupta in the College. We need hardly trace the history of the College destined as it was to a prosperous and highly successful career. In 1838 an outdoor branch was opened, and in this year the first batch of students were qualified as "Sub-assistant Surgeons," and soon after a vernacular class was formed for the education of the "native doctors" still known by the inadequate title of "Hospital Assistants."

In 1840 a lying-in-hospital, the precursor of the present fine Eden Hospital, was opened. In 1845 the lectures were recognised by the College of Surgeons in London and by the University of London. The present main Hospital was founded with masonic honours in 1846 and opened in 1852. In 1847 classes for educating "apothecaries" for service with the European troops were started.

The University of Calcutta which is now celebrating its Jubilee was incorporated in 1857 and the Medical College was affiliated to it.

Colonel Macleod, in the article we quote from, has not much information about the similar medical institutions started in Bombay and Madras, and we hope that they will not want their historian, but he mentions the Hyderabad (Deccan) Medical School, started by W C Maclean in 1844, whom many of our older readers remember at Netley. The Agra School was opened in 1853, and still remains the only school in the United Provinces, though destined soon

to be eclipsed by the splendid New Medical College, at present under construction at Lucknow

The Lahore School began in 1858, and has always enjoyed a high reputation for the excellence of the teaching given. In 1867 Sir R. Temple founded the Vernacular Medical School at Nagpur and soon after another at Patna. Col Macleod does not mention the latter, nor the schools at Dacca, Ahmedabad, and Dibrugarh, the latter due to the munificence of Dr. Berry White, I.M.S., (retd.) Vaccination was very early introduced into India and no country needed it more.

Of recent years the foundation of the Duffield Fund gave a great impetus to the medical education of females, and met with considerable success. Still more recently the efforts of Lady Curzon did much for providing a better class of midwives for native homes, and very recently (January 1908) the first report of Lady Minto's Indian Nursing Association has been published and marks another advance in India.

The training of subordinates for service in the Sanitary Department has not yet received the attention it deserves, except in Madras where the energy of Col W. G. King, C.I.E., introduced a regular system for the training and education of Sanitary Inspectors. A very recent Resolution of the Government of India on the improvement of the Sanitary Department must lead to the better organisation of teaching in hygiene and practical sanitation, which, as far as we know, is still infinitely far behind the teaching given in such subjects as pathology, physiology or chemistry. We may conclude this synopsis of Col Macleod's article by the following tribute to the service which he for so many years adorned —

"To the Indian Medical Service is due the credit of initiating and promoting medical education and relief in India, heartily supported by sympathetic and humane rulers. No measures have been so productive of good will on the part of Indian people towards an alien and imperious race as those which have been undertaken with the view of bringing the blessings of rational prevention and cure to bear on the victims of disease and injury, and creating agencies and appliances in and of the country for the benefit of its inhabitants. In this good work Indian medical officers have displayed enthusiasm and capacity, and, whether as professors in colleges, or as superintendents of schools, or in charge of hospitals, have fulfilled the duties entrusted to them with zeal and ability, imparting knowledge, exhibiting and communicating skill, and setting an exalted example of devotion, humanity and honour, which their pupils have striven to assimilate and imitate."

In spite of all that has been done for the spread of medical education and in spite of the fine Colleges and Laboratories with equipment and teaching staff equal to anything in Europe, nevertheless quackery and every sort of unlicensed practice exists rampant. Even practitioners trained in our modern colleges often fall back into the devious ways of "Homoeopathy" and "Unipathy" (whatever that may be), and diplomates of medicine and surgery of the Government Medical Colleges still practice and (we must suppose) believe in the wild theories and obsolete practice of the followers of the Aynr Veda systems. A strong feeling exists, and is increasing, that the time has come to attempt to control this wholesale trade in medicine, and it is forcibly said that while a man must take out a license to drive a *ticca gharri* or a motor car, he needs no license or authority to trade on human credulity and in human life.

Current Topics.

A CRITICISM OF THE ADVISORY COMMISSION'S REPORT ON PLAGUE

In another part of this issue we have given an abstract of the latest instalment of the Report of the Advisory Committee on Plague, but we have not the knowledge nor the experience sufficient to seriously criticise its methods or its conclusions.

Such a work can only be done by persons wholly engaged in the practical fight against plague, hence, though it may be considered a case of *Impar Congressus Achilli*, still we welcome and we are sure the Committee will welcome a fair and minute criticism on their work such as is given by Dr. William Hossack in his Appendix to the Report on Plague in Calcutta for the year ending 30th June 1907.

Dr. Hossack, we know, has had a prolonged and unique experience of plague, as seen in Calcutta, and consequently his criticisms, where he compares the conclusions of the Committee with the facts as he has found them in Calcutta, are of the greatest importance, for it is by no means yet certain that conclusions which are good for Bombay or for the Punjab hold equally good for Calcutta, a place where plague has never yet been as serious as in Bombay, Poona and many parts of the Punjab. We must, however, bear in mind that owing to the unusual way in which the Plague Commission's Report is being published piecemeal, the final conclusions of the Advisory Committee have not yet seen the light, and with this reservation we may now indicate the points where Dr. Hossack's experience of this disease in Calcutta seem to

challenge the conclusions which have been drawn from the first portions of the Report of the Advisory Committee

Dr Hossack first points out that "in order to transfer plague from a septicæmic plague rat to a healthy one by purely flea contact, the Plague Committee* used a number of fleas that seemed much in excess of anything likely to be found on rats in natural conditions", he also points out that in his experience *M. decumanus* may play a predominant part, a point which is shown to be partly true also for Bombay (see Report, *J. of Hygiene*, Vol 7, No 6, p 761, and *Indian Medical Gazette*, below p 192)

Dr Hossack then questions the statement in the Government Resolution on plague, dated 16th August 1907, that "the vehicle of contagion between rat and rat and between rat and man is the rat-flea". He claims that if this is so, then to account for the thousands of deaths from plague, men must be frequently and severely bitten by fleas, and he rejects the evidence of the Committee's experiments because the conditions were "wholly artificial," as "the godowns were artificially kept up forcing beds for rat-fleas," and he concludes that at the time of his writing (September 1907) "there is no satisfactory direct evidence that men are sufficiently frequently bitten by rat-fleas to account for the numbers who die of plague. He points out that plague workers in Calcutta are not bitten by fleas because of the absence of fleas and he claims to have demonstrated that "rat-fleas even when starved have little tendency to bite man"

He then criticises the mechanical details of flea transmission of plague, and in this we agree with him, for hitherto we have seen no satisfactory explanation of this mechanism, and we are not content to accept that the only abrasion through which man is affected is the puncture of rat-fleas, and the only infective medium, the fœces of rat-fleas. Dr Hossack then concludes that while admitting plague transference from rat to rat, "the mechanism suggested is not satisfactory, and when applied to transference from rat to man is wholly unsatisfactory," on this point we must say that we are in agreement with him

We need not follow Dr Hossack into his discussion of other sources of infection—such as plague-infected pus, fœces, urine, sputum, mucus and blood, he concludes that the "evidence is so very contradictory that it seems probable that there are many modes of plague infection, and in the present state of our knowledge to limit modes of infection to the bite of *P. cheopis* is unsound". One extraordinary difference between Bombay and Calcutta is the great rarity at

certain seasons of fleas in Calcutta, except fleas on dogs. Dr Hossack, as well as Major Vaughan, I.M.S., the Superintendent of the large Campbell Hospital for natives of India "practically never see a flea". This is a clue worth following up, and may be of use when an attempt is made to explain the immunity so far of Eastern Bengal from (non-imported) plague. Hossack has shown elsewhere that the rat belonging to the subgenus known as *Nesokia Bengalensis* is the most common rat in Calcutta and in a series of 420 such rats examined an average of only 2.6 fleas per rat were discovered, and it is questionable if such a small number is sufficient to convey plague. It may be noted that, as in Bombay so in Calcutta, the predominant rat-flea is *P. cheopis*, and we have already published Dr Cricke's paper showing that there is no defined season for rat-breeding in Calcutta, an observation which is in accord with the experiences in the Punjab*

We need not here detail Dr Hossack's experiment and conclusions on the value of rat-killing. Experience in Japan as well as in India is against it, and so far such bacillary poisons, as the Danysz virus, "Ratin" "Ratimin," and "Azoa" (chiefly composed of bacilli of the coli group) has not been practically successful, and we have little hope in any success of the efforts of the recently formed "Vermin Extermination Society"† started in London and on the Continent. Plague itself will not exterminate rats and we doubt if any other virus will do so. We commend this interesting report to all workers on plague. One thing which we think has been established is that what is true for one part of India is not necessarily true for other parts of India, and we are glad to know that the Plague Committee has been reconstituted and is now at work again. We are of opinion that the work should be shifted to other centres, and especially we consider it very necessary that the immunity of districts not yet affected by indigenous plague should be examined, e.g., the large province of Eastern Bengal and Assam‡

CAPTAIN FORSTER'S DYSENTERY INVESTIGATIONS

MUCH attention has been given to the very hopeful work being done by Captain W. H. C. Forster, I.M.S., at the Midnapur Central Jail, where a temporary Laboratory has been established, into the nature and methods of spread of

* We have since learned that there has been a somewhat increased flea prevalence during February and January, up to 6.7 per rat bagged—and on March 5. On the other hand in 32 guinea pig experiments, done in houses with a definite rat plague mortality, the average has only been just over one flea per guinea pig.

† For a body of educated and prominent men to call a Society for killing rats a *Vermin Society* is strange. Surely rodents like rats cannot be included among 'Vermin'. Bad Latin Grammar is common enough, but this is worse.—Ed.

‡ For instance, we learn from a private letter that there is "not a single *Pulex irritans* to be had in Dacca, and the people do not recognise man as a host for fleas in these parts. The only specimens of *P. irritans* seen here was got from hill men in Shillong."

* For the sake of brevity we will refer to the Reports of the Advisory Committee appointed by the Secretary of State for India, the Royal Society and the Lister Institute as the "Committee". They have been published in the *Journal of Hygiene*.

dysentery. We may, therefore, quote the following account, as given by the Sanitary Commissioner with the Government of India, of the progress of the work —

"Captain Forester has furnished three reports of the progress made in the investigation, and a brief summary of the results recorded in the most recent of these may be given here with the saving clause that as the problems of the subject are not easy to solve, the conclusions arrived at are liable to correction in the light of future work. Under the heading of the causes of acute dysentery Captain Forester states that from the stools of different cases he has been able to isolate the bacillus of Shiga, the bacillus of Flexner, the Y bacillus of Hiss and other varieties of the group, but that from the great majority of cases of bacillary dysentery, the bacilli of Shiga or of Flexner have been isolated. In some cases both these bacilli were present. In the cases of dysentery from which the bacilli can be isolated the stools are characteristic and the bacilli give rise to a definite train of symptoms. The vast majority of cases of acute dysentery are bacillary in origin, and, in first attacks of the disease, bacilli of the dysentery group are nearly always present. Captain Forester reports the finding of two types of amoebæ in the stools of patients suffering from dysentery, one has characters similar to those of the *A. histolytica*, the other to those of the *A. coli*. The first type is the one nearly always found, amoebæ are often present in cases of chronic dysentery, but seldom in cases of acute dysentery (13 times in 88 cases), flagellates and ciliates are usually, and Shiga's bacillus is sometimes, present when amoebæ can be found. Amoebæ do not appear to be capable of causing a definite group of symptoms and they are not associated with a definite type of stool. Captain Forester considers that in a proportion of cases the presence of amoebæ in the stools is secondary to an infection with Shiga's bacillus and that usually cases of chronic as well as cases of acute dysentery are bacillary in origin. Under the heading of the mode of spread of the disease he states that in the Midnapore Jail dysentery is not due to infection of the general food or water supply or to infection of the soil, but that there is much evidence in favour of the view that the spread of the disease is due to the presence of 'bacilli carriers'. He has made experiments to ascertain the length of life of the bacilli of Shiga and Flexner outside the human body, in clothing and sheets the bacilli were killed by exposure in the sun for one hour, in blankets by exposure for two hours, and the bacilli could not be recovered from specimen of mucus which had been placed in a glass tube and kept in a dark cupboard for 24 hours. These observations are in favour of the view that the bacilli cannot live in nature as saprophytes. The problem of the spread of dysentery by "bacilli carriers" is now being investigated bacteriologically on the same lines as has already been done in the case of enteric fever."

THE GOVERNMENT MATERNITY HOSPITAL, MADRAS

It is a great pity that this report, one of the most interesting of any medical institution in India, should appear so late, it is dated September 1907 and only reached us in the end of January 1908.

The report is a very interesting one, and deals with no less than 4,378 cases treated during

the year. Out of 1,878 deliveries the women died in 42 cases, 13 from accidents as eclampsia, hæmorrhage, rupture and shock, 10 from septicæmia (9 septic before admission to the hospital), and 19 from various non-puerperal causes (such as heart disease, dysentery, tuberculosis, etc).

In these 42 fatal cases the classes of labours are given as follows — Natural, *nil*, difficult, *ie*, septicæmia 5, cephalotripsy 1, craniotomy 1, cerebral hæmorrhage 1, total 8, preternatural septicæmia 1, complex accidental hæmorrhage 1, placenta prævia 2, eclampsia 3, rupture 2, other complications 17, abortions 8, total 42.

Out of 1,825 deliveries there were 275 at ages 14 to 19, 774 at ages 20 to 24, 396 at ages 25 to 29, and 380 at ages over 30, *ie*, 1,049 or considerably more than half were under 25 years of age, and of the primiparæ out of 525 cases no less than 485 were under 25 years and 249 or nearly half under 20 years.

Out of 1,825 deliveries 1,275 were natural, 168 were difficult, 46 preternatural, 256 complex, and there were 80 cases of abortion. It is worth noting that of 1,275 natural labours no less than 1,260 were "born occipito anterior." Of the "difficult" labours, out of 168, fifteen were tedious, *ie*, over 24 hours, in 124 cases forceps were necessary, 7 were cases of podalic version, there were 13 cases of cephalotripsy and 3 of craniotomy, of the 46 cases classed as "preternatural" there were 20 breech and 8 foot cases, 11 arm or elbow, and 7 compound, out of the 256 deliveries classed as "Complex" there were 22 twins (22 cases out of a total of 1,825 deliveries), and 1 case of triplets, 13 cases of descent of funis, etc.

We may quote the following tables from a number of very interesting ones given in the Report —

I

There were 1,275 labours in which the head or face presented and the labour terminated naturally within 24 hours, and without complications.

The percentage of primiparæ was 24.94. The average duration of labour was in primiparæ 16.7 hours and in multiparæ 8.4 hours. Mortality of mother — Nil.

II

The following table shows the ages, number of pregnancy, and the number of hours of the women in this class (natural) —

Ages of women years	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	Total 1,275
Number of women	2	2	13	11	11	200	224	19	135	55	114	110	76	18	73	17	101	12	27	9	17	34	14	3	10	3	9	1	2	1		

Number of pregnancy	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17	} Total 1,275
Number of women	318	275	198	140	114	75	67	37	26	11	8	3	2		1	

Hours in labour	Under 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 12	12 to 18	18 to 24	above 24	} Total 1,275
Number of women	1	9	63	103	122	130	496	242	93	6	

III

Mode of delivery in laborious labour	Number of cases	Mothers		Children alive		Children still		Percentage of mortality	
		Recovered	Died	Male	Female	Male	Female	Mothers	Children
Induction of labour (Podalic Version and perforation)	1		1						100 00
Forceps	124		121	3	69		40	2 42	12 09
Cephalotripsy	12		10	2			10	16 66	100 00
Version and forceps	1		1						100 00
Cephalotripsy after Version	1		1				1		100 00
Podalic Version (1 forceps to after coming head)	7								100 00
Cephalic Version	3		6	1	2		2	14 29	42 86
Decapitation (Extraction)	1		3		1		1		66 66
Craniotomy	3		1				2	100 00	100 00
			2	1			1	33 33	100 00

IV

The forceps was employed in 145 cases or 1 in 12.5 of all cases admitted, a slight increase compared with last year when it was 1 in 14.1

Table showing forceps cases—145 cases

Indication	Number of cases	Primiparæ	Multiparæ	Result		Position			
				Mother	Infant	1	2	3	4
Inertia	68	45	23	* 3 died	8 still	55	13		
Rigidity of cervix	9	5	4	+ 1 died	1 still	7	2		
Prolapse of cervix	8	2	6	Good	1 still	7	1		
Contracted pelvis	8	5	3	Good	1 still	4	3		1
Occipito posterior	24	14	10	Good	1 still			16	8
Distress of infant	7	4	3	Good	2 still	6	1		
Prolonged labour	1	1		Good	Good	1			
Cord round neck	1	1		Good	Good	1			
Rigidity of soft parts	1	1		Good	Good	1			
Bow presentation	1	1		Good	Good	1			
Anæmia and anaemia	1	1		Good	Good	1			
Prolapse of cord	1		1	Good	Good		1		
Sarcoma of pelvis	1	1		Good	Good		1		
Puerperal eclampsia	4	4		Good	Good	1			
Accidental hemorrhage	2		2	+ 2 died	1 still	4			
Rupture of uterus	1		1	Good	2 still	2			
Prolapse of funis	3	1	2	Good	Still	1			
Valvular disease of heart	2	1	1	Good	2 still	3			
Twins	1		1	1 died	1 still	1	1		
Short cord	1		1	Good	Still	1			
				Good	Good	1			
Total	145	87	58			97	23	16	9

Ages				14 to 20	21 to 25	26 to 30	31 to 35	36 and over	} Total 145
Number of cases				74	32	29	4	6	

Pregnancy	1	2	3	4	5	6	7	8	9	10	11	} Total 145
Number of cases	88	18	9	6	8	6	4	1	2	2	1	

NOTE — The youngest woman was 14 years old and the oldest 40

V

The percentage of primiparæ was 13.53, which is considerably lower than that of last year 28.78

An average of 152 cases were delivered monthly as compared with 179 in 1905. The largest number of deliveries took place in September (213 births) and the smallest in February (115 births).

Races and castes—The percentage of the various races and castes is shown in the following—

Europeans	41	or	2.25	per cent
Eurasians	293	or	16.06	do
Hindus	467	or	25.59	do
Muhammadians	21	or	1.15	do
Native Christians	240	or	13.15	do
Parsees	3	or	0.16	do
Punchamas	760	or	41.64	do
Total	1,825	or	100.00	

The deliveries may be thus classified—

Natural labour	1,275	or	69.86	per cent
Difficult do	168	or	9.21	do
Preternatural labour	46	or	2.52	do
Complex do	256	or	14.03	do
Abortions	80	or	4.38	do
Total	1,825	or	100.00	

There is a comparative falling-off under natural, preternatural, complex labours and abortions and an increase under difficult labours.

The following shows the general classification of the 1,825 confinements—

Delivery at full term	1,467
Do before full term	255
Do of macerated or putrid children	23
Abortions	80
Total	1,825

Major G. G. Giffard, I.M.S., the Superintendent, makes the following remarks—

"As it now seems to be fashionable in Europe to gauge the efficiency of a Maternity Hospital by an arbitrary morbidity rate (which leaves out abortions, although abortions are considered here to test the surgical aseptic efficiency of a hospital more severely than full term deliveries), the figures this year have been worked out according to the several different ways now adopted by various maternity institutions.

Queen Charlotte's Hospital standard	21.4	per cent
Two temperatures of 100° (not necessarily consecutive) between 2 and 8 days—(no abortions but all deaths included)	13.4	"
Foreign method 100° 6 once between 2 and 8 days—all cases	6.8	"
B. M. A. method Two consecutive temperatures of 100° between 2 and 8 days (abortions excluded but all deaths included whether feasible or not)	9.0	"

It is difficult to see how a hospital in this country can hope to compete with those of a similar size and nature in Europe when the women admitted pregnant or in labour are found, not seldom, to be suffering from such

diseases as malaria, dysentery, beri beri, dengue, small pox, pyroplasmosis, etc., all of which diseases are accompanied by pyrexial irregularities of temperature. Again, a glance at the record of deaths will show the awful condition in which women in labour arrive at this hospital (see Colonel Storer's report, 1904). A surgeon who has never practised in India can have no idea of this barbarism and filth of the treatment meted out to the lowest classes of native population by their hereditary nurses, the village barber midwives.

Without intentionally disputing the claim made by another similar but European institution (in its annual report) to be "The Premier Maternity Hospital of the British Empire," it seems reasonable (with an annual number of deliveries equal to that of the largest institutions in Great Britain and Ireland) to hope that this hospital may perhaps be considered to be holding its own in the recently organized World's morbidity race. From June 1906 it has become the practice in this hospital to entirely separate, from the moment of their admission into hospital until their discharge, those women who have been in any way attended to or vaginally examined outside the hospital from those (fortunately the majority) who come to the hospital direct and untouched. The hospital has since that date been so reorganised that those two classes of women are provided with separate wards, nurses, operation room, instruments and linen and only the medical officers in attendance are common to both. It is hoped, in this way, to be able next year to give separate morbidity rates for the two classes of patients in addition to the totals of the whole hospital. Another change has, however, been simultaneously introduced which will, from a statistical point of view, tend to lower the hospital's apparent efficiency. It was the custom until June 1906 to refuse admission to all women who had been confined outside the hospital 24 hours previously. We hope that now the hospital is in a condition to take in and safely treat all women who suffer from any disease of pregnancy or its sequelæ. By so doing many more septic cases will appear in our statistics. The Government of Madras have sanctioned a scheme of extensive structural alterations which will take up the whole of 1907 to complete, and about which a full statement will appear in the Annual Report of 1907."

We congratulate Major Giffard and his staff on the excellent work done during the year. This is a splendid institution and admirably managed.

TYPHOID CONVALESCENTS AND BACILLUS CARRIERS

Of the many interesting subjects dealt with in the recently issued Report of the Sanitary Commissioner with the Government of India for the year 1906 there is none of more general interest than the account given of the results of the committee of investigation at the Central Research Institute at Kasauli.

Some of our readers may remember that in June 1906 we published (*I. M. G.*, p. 222) an account of Captain E. D. W. Greig's deputation to Germany to study the method there in vogue for fighting typhoid. The committee of investigation have closely followed these lines and an interim report by Captain Greig, I.M.S., is promised. Meantime we may sketch the work done by the committee as given by Lieutenant-Colonel Leslie, I.M.S., in the Report of the Sanitary Commissioner, India, for 1906.

In the epidemiology of typhoid the part played by convalescents, the so-called "bacillus carriers" (*Bazillenträger*) is of the greatest importance according to the modern German view. There are three classes of such persons—

1 Patients convalescent after typhoid who may excrete the bacilli in their faeces and urine for several weeks,

2 Persons quite recovered, who continue to excrete the bacilli ten weeks or more after the beginning of the attack (called "chronic bacillus carriers"), and

3 Persons in whom the bacillus enters and leaves the intestine without causing any symptoms of illness, called "temporary bacillus carriers."

It is reckoned that in about two-thirds of cases the return of typhoid bacilli in the faeces and urine does not cease with the cessation of the fever, but continue for several weeks after convalescence, and what makes investigation more difficult, this excretion intermits, that is, may cease for a short time and then begin again. To obtain a definite result, the stool and urine of convalescents must be examined after two weeks, and again three weeks after cessation of the fever, and if a positive result is obtained, the examination must be made every week till the absence of bacilli has been proved on at least three successive occasions, and, indeed, subsequently two or more examinations should be made during the next year, and finally, it is stated that "those who are known to be bacillus carriers" should be kept under bacteriological control for many months.

These observations have been found to hold good for convalescents after typhoid in India, and in 87 patients of Captain Greig ten were found to be shedding bacilli longer than six weeks after cessation of fever and in 16 cases for more than three months.

It is obvious that these are observations of the utmost importance, and consequently infection by contact may be either direct—*i.e.*, from the patient to those who come in contact with him, or indirect from the patient to articles which he touches and to persons who come in contact with them. It is also worth noting that a patient is not so dangerous to others during the actual attack as during the convalescent stage and the stage in which he is a bacillus carrier, and obviously most dangerous of all are those mild ambulatory cases, which are not recognised and against which no special precautions are taken. It is obvious that the spread of these views must lessen the importance of the part played by flies as carriers of the disease. Man himself, the convalescent patient, is the chief carrier of the disease. It has been well established that the life of the typhoid bacillus outside the human host is very short, and "therefore the persistence of the disease cannot be explained by any hypothesis which postulates a long viability of the bacillus in

the external world." Experiments made at the Central Research Laboratory have shown that "typhoid bacilli in cotton sheeting were killed by exposure in the sun for two hours," and those in the blanket were all killed by exposure in the sun for six hours, and bacilli in pieces of sheeting and blanket kept in a dark cupboard were found capable of being isolated after six days but all were dead in 17 days.

The above conclusions are extremely important and fully justify the establishment of the committee of investigation. The measures of prevention indicated are sufficiently obvious, but, as too often happens, they are certainly difficult.

Still, when we consider the havoc played by typhoid in India and the loss of so many valuable young lives, it is clear that as regards expense the cost would soon be recouped. The establishment of special convalescent camps in the hills for about 1,000 patients during the year is a big undertaking, but is logically and absolutely necessary, and with these camps must be fully equipped laboratories and well-trained staff of bacteriologists.

We earnestly hope that this attempt will be made and meantime we can congratulate the members of the committee of investigation* in the results of their labours.

NEW VIEWS ON MYCETOMA

WE have become accustomed to look for valuable articles in the *Philippine Journal of Science*, and the issue for December 1907 (Vol II, No 6) is no exception.

Apart from good articles on tropical ulcerations and on cestode parasites in the Philippine Islands, there is a good report on experiments in malarial transmission by means of *Myzomyia Ludlowi*, and the paper by Dis Musgrave and Clegg which we propose to refer to more fully.

In this paper these well known workers, in addition to giving a very complete synopsis of the history of mycetoma and a full bibliography, bring forward a case of the ochroid variety of mycetoma, which they state is caused by a new species of streptothrix, called by them *streptothrix freeri*.

The confusion which at present exists as to the precise etiology of mycetoma or Madura foot is well illustrated by the opposing views in two of the very latest systems of medicine. In Wright's article in Osler's *Modern Medicine* it is claimed that the black variety is a separate and distinct variety and due to a *hyphomycete* and the ochroid variety, according to Wright, must be regarded as an actinomycosis. On the other hand, MacLeod in Allbutt's *System* recognises

* The members were Lieutenant Colonel Semple (ret'd), Captain Greig, I.M.S., Lieutenant Colonel Wyville Thomson, I.M.S., Captain D Harvey, R.A.M.C., Captain F.N. White, I.M.S., Captain E.C. Hodgson, I.M.S., and Assistant Surgeon P. Ram.

Vincent's *Streptothrix Madura* as the cause of the oclmoid variety and that the black variety is due to a degenerate variety of the oclmoid parasite

It is well known that the subject of mycetoma or Madura foot has been well studied by observers in India and particularly by Timothy Lewis, D D Cunningham and by Vandyke Carter. The present authors give a very full account of their case, and have arrived at the conclusion and proved it by animal experiments that the "causative organism is a streptothrix," which as it differs from previously described fungi of the same genus they have called *streptothrix freeri*. They believe that their investigations have established the etiologic importance of *S. freeri* in the oclmoid variety, but they admit that the origin of the melanoid variety is as yet undetermined, and though it is very probable that all types are due to streptothrix infection, it cannot yet be positively stated whether all forms are caused by an infection with a uniform organism, or whether more than one species plays a part in the disease, and they feel certain that *Actinomyces hominis* is a different species of streptothrix from those producing mycetoma

THE article, "a case of Gonorrhoea Rheumatism," in our February Number, was by Capt C Broadbent, not Broadbent as printed

Reviews

Diagnostics of the Diseases of Children —

By LE GRAND KERR, M D W B Saunders Co
Pp 542, figs 159

THIS book, a very complete one and written practically, gives a good view of the diagnosis of diseases of children, and the criticisms below are to be read in the light of what has just been written. Probably the best chapters are those on cough and whooping cough, on convulsions, on diphtheria and on cerebral infantile paralysis. Malaria is given a rather large place as a cause of symptoms not usually attributed to it, it is held responsible for diarrhoea, bronchitis, and rigidity of the neck, the characteristics of all of them being that they are periodic and yield to quinine.

The blemishes in the book are of various kinds. In one place the spleen is said to be normally palpable at birth, in another this is said not to be the case, epistaxis is stated to be a marked feature of rheumatism, but under rheumatism no reference is made to it. The portion devoted to heart disease is disappointing, while regretting to have to classify an aortic systolic murmur as functional, no reference is made to roughening of the valves as its cause, when the associated signs of stenosis are absent. In one place the two sounds of the heart appear

to be referred to as the systolic and diastolic murmurs. Again, the diagnosis of diabetes insipidus from chronic interstitial nephritis is made to rest solely on the absence of high arterial tensions and its results in the former, Hutchinson's teeth are looked upon as strong evidence of acquired as opposed to hereditary syphilis, no reference is made to the occasional and notorious difficulty in diagnosing pleural effusion in children and the fluid of hydrocele and of oedema is called serum. The suggestion to apply a condom to collect for examination the urine of a male baby, though ingenious, would probably be too great a shock to the susceptibilities of the parent on this side of the Atlantic. The scheme of the book is embracing, it takes up symptoms one by one, it then considers diseases regionally and as entities, it is well illustrated, and though the English is in places distracting, and the book has the drawbacks just enumerated, it is, nevertheless, a good one.

Aids to Pathology — By HARRY CAMPBELL, M D
LOND, BSC, FRCP, London, Senior Physician
North-West London Hospital, etc. Pages 184,
Illustrations 10 Price, 3-6 net Publishers
Messrs Baillière, Tindall and Cox, 1908

THE present addition to the students' aids series fulfils in a very excellent manner the end for which the series has been published, viz, to assist students in committing to memory and grouping the subjects on which they are to be examined. As aids, not substitutes, these little books afford the means of refreshing the memory and of economising time.

In the pages before us the author presents briefly and concisely the known facts of Pathology. There is no pretence to a complete or exhaustive treatment of the subject, the description of each disease must be only regarded as a frame work into which all information otherwise acquired may be fitted. Nevertheless, this little book does supply a wonderful amount of information with regard to the known facts of Pathology and the section on immunity and opsonins explains in a very lucid manner what is known about this difficult subject.

We have no doubt that used in conjunction with a good modern text-book students will find this "aids" exceedingly useful.

Practical Diagnosis, The use of Symptoms and Physical signs in the Diagnosis of Disease — By HOBART AMORY HARR, M D, BSC,
Professor of Therapeutics in the Jefferson Medical College of Philadelphia, Physician to the Jefferson Medical College Hospital, etc. Sixth Edition revised and enlarged, illustrated with 203 engravings and 16 plates. Pages 616 Price 21 net Publishers Henry Kimpton, London, and Alexander Stenhouse, Glasgow, 1907

THE earlier editions of this most useful volume on practical diagnosis have already been most favourably commented on in these columns and

have been most cordially received by the reading medical community. There is nothing, therefore, to be gained by an elaborate analysis of the enormous mass of information it contains, suffice it is to say, that the present edition embraces an exhaustive consideration of every symptom and physical sign known to medicine, laboratory methods are taken up only in those cases in which they are essential to arriving at a correct diagnosis, as, for example, in the examination of the blood and urine. We have no hesitation in saying that every physician should have a copy of this book in his library and that by reference to it in cases of difficulty he will obtain much useful information and valuable hints to diagnosis.

Medical Laboratory Methods and Tests —

By HERBERT FRENCH, M.A., M.D. (Oxon), F.R.C.P. (Lond.), Assistant Physician, Guy's Hospital, etc. Second Edition. Pages viii and 168, Illustrations 29 coloured and 59 plain. Price 5s net. Publishers Messrs. Baillière, Tindall and Cox, 8, Henrietta Street 1908.

THE first edition of this little book was published in 1904 and at the time met with a most favourable reception. It filled a long-felt want, viz., a small handbook dealing with the chemical and microscopical tests and investigations which are most useful to medical men. In the present edition many new methods and tests have been included in the letter-press, and most of the diagrams have been redrawn.

The original object of keeping the volume as small as possible has been maintained.

As a small handbook of the commoner laboratory methods we can confidently recommend it both to medical students and practitioners.

A Manual of Anatomy — By A. M. BUCHANAN, M.A., M.D., CM., F.F.P.S. (Glasgow). Pages xi and 950 with 362 Illustrations. Publishers Baillière, Tindall and Cox, London. Price 12s 6d net.

VOL. II of Professor Buchanan's Manual of Anatomy deals with the anatomy of the abdomen, thorax, head and neck, the central nervous system, and the organs of the special senses. The descriptions are clearly written, concise and generally correct, though there is nothing very striking in the matter of the text.

The instructions for dissection, which are appended to each section, as in Vol. I, and which constitute the "practical anatomy," are not always full enough, and though the student is told what to do, he is not always told how to do it, there are also no explanatory plates or diagrams to assist him.

The accounts of the development of the various organs and parts placed after the various descriptions are short and generally correct, but the want of continuity may prevent the student from gaining a satisfactory idea of the general developmental history of the human body.

There is an appendix of English and Latin equivalents of various anatomical terms, and also a glossary in which explanations of various terms is given. The book is well got up, clearly printed on thin paper, and there are many excellent illustrations, and on the whole the book is good and readable and of a convenient size.

A Treatise on Surgery — By GEORGE RYERSON FOWLER, M.D. Published by W. B. Saunders Company, Philadelphia & London. 2 Vols.

THE book is divided into the consideration of general and of regional surgery, and begins with a chapter on inflammation, in which is included the technique by means of which sepsis is to be prevented, and a certain amount of bacteriology. There is a very useful chapter on laboratory aids in surgical diagnosis and prognosis, illustrated by three coloured plates, followed by one on anaesthesia. Ether is strongly recommended, and of chloroform the author is obviously frightened. This is not to be wondered at, seeing that he considers death to occur from cardiac failure, though, as is usual with those who hold these opinions, he pins his faith on artificial respiration as the means by which to combat cardiac failure. He passes on to general principles of operative technique and operations on individual tissues, in which suture of arteries and of nerves holds a prominent position. The last chapter of the first part of the book is a fully illustrated one on bandaging.

In the part on regional surgery the points which seem to call for comment are these. The author does not believe necessarily in the routine removal of the nearest lymph glands with the lymphatic drainage area between them and a cancer which is being extirpated. For instance he advocates the simple V incision in cancer of the hip, saying that if carried well beyond the growth, this will in the great majority of cases effect a permanent cure. Plastic operations on the face are fully dealt with and illustrated. No mention is, however, made of aneurism of the aorta in the lines on the cause of compression of the oesophagus from without, the chapters on the neck and chest are otherwise full and complete. The pages on peritonitis are most useful, though the use of such terms as a pulse with a "gaseous" character is to be deprecated as conveying nothing outside the small circle of those initiated into its use by the inventor of the term, and we think that more might be made of Murphy's work and results. It is, however, indeed, a satisfaction to find the author discountenancing the method of aspirating for liver abscess through the abdominal wall, a method almost universal in this country. He exposes the organ by laparotomy and shuts off the peritoneal cavity by pads before aspiration, he does not refer to the aid which the recognition on palpation of oedema of the liver may give in localising the abscess, if acute. A chapter on the surgical diseases of the female

generative organs finds a place in the book. The two volumes, which together weigh just under a stone, are printed on thick highly glazed paper, which enables beautiful illustrations to be produced. There are 888 of these and four coloured plates, all original and all excellent, if somewhat startling at times. The book is good and up to date, and likely to be in considerable demand, thus repaying the obvious care taken in its production.

Surgical Instruments in Greek and Roman Times—By JOHN STEWART MILNE, M.A., M.D. (Aberd.) With illustrations and 54 full-sized plates. Publishers Oxford Clarendon Press 1907. Price, 14s net.

THIS most interesting monograph was presented as a thesis which formed part of the examination for the degree of M.D. of the University of Aberdeen, and it gained for its author "Highest Honours."

The object of the book is to lay before the student of medical history an account of the various instruments with which the ancient Greeks and Roman surgeons prosecuted their craft. To understand any of the surgical operations described in the classical authors, it is absolutely necessary to have a clear conception of the instruments made use of. Comparatively little attention has been given to this department of archaeology, the literature bearing on it being scarce. It was to meet this want that the present thesis has been written. The method pursued was to make a complete examination of the classical, medical, surgical, anatomical and pharmaceutical writings, extracting the portions in which the different instruments are mentioned.

Finds of specimens in various localities and museum specimens were examined, failing actual ancient specimens, the author has fallen back on mediæval or ancient Arabian authors for illustration.

To those whose tastes run on the lines above indicated, the book will prove a positive treasure-house full of the most interesting riches of ancient and mediæval surgical appliances. The volume is exceedingly well produced with a good index and beautiful illustrations.

A Dictionary of Medical Diagnosis. A treatise on the signs and symptoms observed in diseased conditions for the use of Medical Practitioners and Students By H. L. McKISACK, M.D., M.R.C.P. (Lond.), Physician to the Royal Victoria Hospital, Belfast. Publishers Messrs Baillière, Tindall and Cox, London 1907. Pages xii and 583. Illustrations 77. Price, 10s 6d net.

WE welcome the production of this most useful book—useful to the practitioner, but especially so to the student desirous of a knowledge of the medical terms made use of daily in the wards of a teaching hospital. There will be found in this volume a large amount of accurate information, concisely written, and

arranged alphabetically. Beyond passing references to the affections giving rise to the symptoms under consideration, the author has avoided the discussion of diseases and has restricted the descriptions to the various signs and symptoms of disease. The consideration of diseased conditions is left to the text-books of medicine, for which the present work is not intended as a substitute, but as a complement.

The value of the publication is enhanced by three special articles—The Examination of the Blood by Dr. Thomas Houston, X-ray Diagnosis by Dr. J. C. Rankin and the Examination of the Sputum by Dr. J. E. MacIlwaine, all specialists in their respective subjects.

We have no hesitation in recommending this volume to the notice of practitioners and specially to students, and we have no doubt that it will be found a most useful and practical help to the acquisition of a working knowledge of medical terms.

The Practical Medicine Series, comprising ten volumes on the year's progress in Medicine and Surgery.—Under the general editorial charge of G. P. HEAD, M.D. Volume I—General Medicine. Edited by F. BILLINGS, M.S., M.D., Rush Medical College, Chicago, and J. H. Salisbury, A.M., M.D., Prof. of Medicine, Chicago Clinical School. Series 1907. Publishers The Year Book Publishers, Chicago.

THIS series of volumes on practical medicine has been published primarily for the general practitioner, but at the same time the arrangement in several volumes enables those interested in special subjects to buy only the parts they desire.

Some changes have been made in the departments of the series—physiological, bacteriological and pathological matters have been treated of in connection with the subjects to which they bear the closest relationship in practice.

The volume before us—Volume I—deals with diseases of the respiratory and circulatory organs of the blood vessels and blood-making organs, with general infectious diseases, new epidemic diseases, diseases of ductless glands and kidneys.

A most excellent article of 110 pages on tuberculosis, thoroughly up-to-date, opens this part of the series, then follows a most careful compilation of the most important points of our knowledge regarding the different diseased conditions enumerated above. Practitioners who wish to get all recent advancements in a concise and readable form, will find their wants supplied by this series.

Messrs G. Gilhes & Co., 25, Gibson Street, Glasgow, are the sole agents in the United Kingdom for its supply.

Syphilis in the Army—By MAJOR H. C. FRENCH, R.A.M.C. London, 1907. John Bale, Sons & Danielson, Ltd.

IN the volume before us Major French deals with a subject of considerable importance to the

Medical Officer in charge of British troops. The book is based upon a report sent in by the author to the War Office in 1903 regarding the urgent necessity which then existed of revising the method of keeping statistics of venereal diseases among soldiers in the Army. The present book amplifies the report and shows the detailed working of this branch of preventive medicine in the Army. Since the date of Major French's report, the Medical Department of the War Office has published a scheme of "instructions" regarding procedure in cases of syphilis (which our author gives in full as Appendix XXXV).

We need not go into the matter of these instructions as they are in the hands of all interested. Most of our readers are concerned only with the Native Army of India, and as Major French says "Venereal disease is ten times greater amongst British than amongst Native troops. The Native soldier is usually married, remains for four or five years in the same place, knows the country, and usually associates with a better class of women. Further he is under a long service system. Nevertheless the annual invaliding and death ratios for Native troops are excessive, and we are justified in assuming that many cases must be severe, concealed or untreated. Out patient treatment should be more systematically practised among Native troops."

The book shows an intimate knowledge of the ways of the British soldier in India, and can be confidently recommended to all Medical Officers in India who are in charge of cantonment hospitals.

Green's Encyclopedia and Dictionary of Medicine and Surgery—Vol VI Lumbur Region—Nephrotomy. Wm Green & Sons, Edinburgh and London, 1907.

We have already expressed the good opinion we have formed of the former volumes of this admirable encyclopedia. The sixth volume is a large one and contains a vast amount of matter. There are no less than 48 articles of more than 1,000 words in length. These deal with such subjects as lungs, lunacy, malaria, measles, the history of medicine, the meninges, menopause, menstruation, morphia, micro-organisms and meteorology affection of the nails and nephritis. There are innumerable small articles on many subjects.

Among the articles which we have read we should mention that on Malaria by Dr Rees, on forensic medicine by H. H. Littlejohn, and one by Professor Osler on Cerebro-spinal fever. The volume is copiously illustrated.

Practical Fever Nursing—By E. C. REGISTEX, M.D. London and Philadelphia. W. B. Saunders Co., 1907.

THE literature now available for nurses is very considerable, and we have never been convinced that it is possible to half-educate nurses in medicine, surgery and pathology. This

we know is not a popular opinion, and books like the one before us, which give the nurse an opportunity of acquiring "some knowledge of the disease and its medical treatment" are the result of this attempt to train half-qualified assistants.

In the book therefore we have a small practice of medicine (as far as febrile diseases are concerned) in which the causation, symptoms, complications, diagnosis (not the nurse's business), prognosis and treatment are all described in as simple and untechnical language as is possible. Whether to effect this it is necessary to give a rather badly executed picture of the "Estivo-autumnal parasite" and an illustration of the various poses of the culex and the anophelines is very doubtful, and we think it quite unnecessary to burden the nurse's memory with a picture of the staphylococcus pyogenes aureus in an agar-agar culture. Like all the well got-up books published by the W. B. Saunders Company, the book is well illustrated, but we think the reproduction of the photograph of taking the pulse and injecting antitoxin to be useless and a waste of money. Nor is there any useful end to be served by publishing a picture of a man and a woman in costume, bending over the ends of a bed and supposed to illustrate "lifting the patient into the tub." We think these illustrations are quite useless, as also is that of a nurse giving an hypodermic injection. The book is sound in its teaching. In our opinion it tries to do too much, but for those who believe in this amount of medical education for nurses we can strongly recommend the book.

The General Dispenser.—By K. S. AGNIHOTRI, Hospital Assistant, Gargoti, Kolhapur State. The Medico Scientific Press, Delhi, 1907. Price, Re 1-4.

THIS useful little book is intended to be of use to the dispenser or compounder who is in the introductory chapter rightly described as "one of the important men in a hospital."

The little book consisting of less than 200 pages contains a vast amount of useful information on hospital duties, dosage, powders, 'spoonfuls,' weights and measures, specific gravity, thermometers, lotions, infusions, pills and plasters, cataplasms and ointments, etc. It is full of tables and is really a wonderful little compilation and can confidently be recommended to compounders and dispensers in hospitals and dispensaries especially in the *mofussil*.

Blood Examination and its value in Tropical Disease—By C. F. FOTHERGILL. London. Henry Kempton, 1907. Price 2s 6d.

THIS little book is introduced by a preface from Major Ronald Ross. It is written to emphasise the now recognised value and necessity of making examinations of the blood in the making of a correct diagnosis of tropical

diseases. We all recognise this in cases of malaria, kala-azar, filariasis, tick fever, etc.

The book will be found very useful to those who have not yet adopted modern methods of diagnosis. The little book is made more valuable by the quotation of some 30 cases from the wards of the Seaman's Hospital. It can be recommended to beginners.

Wintering in Rome—By A. G. WELSFORD and G. SANDISON BROOK. London: The Health Resorts Bureau, 1907. Second Edition, pp. 101.

We have read this little book with much pleasure. It first appeared in Rome under the title, "Rome as a Winter Resort," and opportunity has been taken in preparing the second edition to revise and amplify the text. The main value of the book for medical men, though it is written in a style understood of the laity, is that it very emphatically disposes of the long current myths about the supposed unhealthiness of Rome. These current notions, chiefly derived from guide-books, are often repeated, and it is entirely forgotten that they largely belong to an insanitary past, and the large amount, which has been done of recent years to remedy matters, is usually overlooked or forgotten.

The statistics given in this book will come as a surprise to those who regard Rome as a hotbed of typhoid and malaria. As a matter of fact, it is quite rare to encounter now-a-days a case of enteric which has been contracted in Rome, and malaria has become a *quantité négligeable*. Dr. Brock has never yet encountered a single case of malaria which was contracted in Rome itself. Another unfortunate prejudice against the night air is also effectively disposed of in this book—"a mosquito is in fact a rarity." Very good advice as to choice of rooms and hotels is given, and the book can strongly be recommended to all contemplating a visit to the Eternal City.

REPORTS

THE PLAGUE ADVISORY COMMITTEE'S REPORT

THIRD INSTALLMENT

THE work of the recent Plague Advisory Committee, is slowly coming to light through the unsuitable medium of extra numbers of the *Journal of Hygiene*, and the most recent instalment has appeared as No. 6 volume VII, of that first class periodical. We would have infinitely preferred the more rapid and cheaper method of publication as a report published by the Government of India, but as it has seemed good to do otherwise, we must possess our souls in patience and await the two further remaining instalments of this really fine report.*

The present instalment dated December 1907

(*J. of H.*, Vol. VII, No. 6) is a very valuable one.

The first chapter is only a review of recent observations on the epidemiology of the disease, but the next three sections form a very valuable report of epidemiological observations on plague as actually found in a portion of the city of

Bombay and in four villages close by. The last section contains the report of the work done in the two selected villages in Parsurb district, named Dhand and Kasel. As this portion of the report runs to about 300 pages, it is impossible for us to do more than give the conclusions arrived at while strongly recommending a study of these model inquiries to all men working at plague.

RATS AND PLAGUE IN RATS

On the all important subject of rats the Report has much to say and we note that the rat known as *Nesokia Bengalensis* though found in Bombay only accounts for one per cent of the rodent population in that city, and therefore its recent differentiation in Bombay does not materially affect as to the prevalence of *Mus decumanus* which on superficial examination so closely resembles.

The Report states—

(1) *Mus decumanus* and *Mus rattus* are the most important species of rodent in Bombay in relation to plague.

(2) Both species are closely associated in certain common haunts.

(3) *M. decumanus*, though typically an out of door wandering rat, in Bombay, not infrequently found in the lower floors of houses "and is practically confined to Bombay city and does not occur in outlying villages in the Island," owing to the absence of gullies, drains, &c.

(4) With regard to the epizootic among rats, the following conclusions are formulated,

that "*Mus decumanus* and *M. rattus* are equally susceptible to plague."

(5) "The incidence of plague is twice as great on the *decumanus* population as on the *rattus* population."

(6) *M. decumanus* is the species chiefly responsible for the diffusion of plague among rats in Bombay City.

(7) The *decumanus* epizootic precedes the *rattus* epizootic by a mean interval of about ten days.

(8) The *rattus* epizootic is directly attributable to the *decumanus* epizootic.

(9) Plague persists in the rats in Bombay City during the off season. This persistence is chiefly due to *Mus decumanus*.

(10) *Mus decumanus* harbours more than twice as many fleas as *Mus rattus*.

THE RELATIONS OF EPIDEMIC TO EPIZOOTIC PLAGUE

The interrelations of the epidemics and epizootics are summarised as follows—

(Report p. 767) —

(1) The time relation of the epidemic and the *rattus* epizootic is explicable on the view that the rat flea is the transmitting agent from *M. rattus* to man.

(2) From the point of view of place infection there is an intimate relation between the epidemic and the *rattus* epizootic.

(3) There is a definite quantitative relation between the incidence of human and rat plague.

(4) The epidemic is directly attributable to the *rattus* epizootic and since this epizootic is in its turn directly attributable to the *decumanus* epizootic, the epidemic is indirectly attributable to the latter epizootic.

"while the latter conclusion expresses the broad relations of the epidemic and the epizootics it must be added that

(5) Infection is occasionally transferred directly from *M. decumanus* to man, i.e., without the intervention of *M. rattus*.

MODES OF INFECTION AND SPREAD

We need not follow the description of the houses in Bombay as such conditions are well known to us who have lived in India, but the following important conclusions deserve quotation in full—

(1) Our observations in a plague hospital lead us to conclude that such a mode of infection as by direct contact does not exist. "contact with plague cases plays no part in the spread of the epidemic."

(2) "In discussing the question of the infectivity of houses evidence has been brought forward which points to the rat flea being the transmitting agent from rat to man. Further reasons have been given for the view that plague does not persist in a locality apart from infection amongst the rats."

(3) "From arguments brought forward in the discussion of the two previous questions we conclude that the epidemic is wholly dependent upon the epizootics."

(4) "It has been shown that infection may be transported to a distance by means of rat fleas in clothing or merchandise and that such an infection when imported into a hitherto uninfected locality, may give rise to an epizootic in the rats."

(5) "Our observations lead us to conclude that plague in domestic animals in Bombay either does not occur or occurs so seldom that it cannot be said to possess any significance from an epidemiological standpoint."

* This report of the Advisory Committee will be found piecemeal in the following numbers of the *Journal of Hygiene*: first as Vol. VI No. 4 second as Vol. VII, No. 3, both price 6/- net each and third as Vol. VII, No. 6, price 6/- Two more to follow.—E.A., I.M.G.

* If it will be noted that this report, also Dr. Pearce's (of Hong Kong) report and Bannerman's experiments give no support to the misleading conclusions of W. J. Simpson, in which he claimed all sorts of animals pigs, poultry, sheep, cattle, to be susceptible to plague.

PLAGUE IN PUNJAB VILLAGES

The rest of this volume is devoted to the very complete and detailed reports on observations made in the two Amritsar villages of Dhund and Kasel.

We can only quote a few of the statements and conclusions—

(1) The rats taken in these Punjab villages were all of one species, viz—*Mus rattus*, who is in the Punjab as in Bombay “essentially a house rat.” The Punjab *rattus*, however, burrows extensively and his nests are always found within the burrows. These ramifying burrows open up communication between contiguous houses.

(2) No special breeding season could be found, though breeding takes place “to a less extent” in the cold weather months.

(3) *Mus rattus* does not leave the villages and migrate to the fields at harvest time, but *N. bengalensis*, does migrate to the fields and is found during the harvesting of the spring crops.

FLEAS, RATS AND RAT BURROWS

(4) In the Punjab (as in Bombay) the common rat flea is *Pulex cheopis*, (98 per cent.) This flea has also commonly been found on musk rats, and gerbils.

(5) Only 2 per cent of fleas on Punjab rats belonged to the species *ceratophyllus fasciatus*. It is a cold weather flea, and *P. cheopis* is also most prevalent in the months of November to April.

(6) In the period under report in Dhund rat plague preceded human plague, and human plague ceased shortly after the cessation of plague among the rats.

(7) Owing to the free communication by means of rat burrows, it was found that the “association which existed between plague cases and plague rats found in an adjoining house, may often have been more intimate than that which often obtains between human cases and plague rats in different rooms or on different floors of large premises such as exist in cities.”

PLAGUE IN KASEL VILLAGE

In Kasel village it is also shown that (1) Rat plague preceded human plague, (2) human plague ceased shortly before the cessation of acute plague among the rats, and (3) a quantitative relation existed between rat plague and human plague. The relations of the epidemic to the epizootic in Kasel are here summarised (Report 956)—

(1) Of 75 cases 4 were imported.

(2) Of 71 indigenous cases 61 occurred in houses in which or in the immediate vicinity of which plague infected rats had been found prior to attack.

(3) Plague rats were not found in or near the residences of the remaining ten cases prior to their attacks, but six of these had visited at houses where plague rats had been found.

(4) Of the remaining four cases one was a doubtful case, and plague rats were found in the vicinity of the three other cases some days after they fell ill. On the subject of fleas and infection certain experiments made are summarised as follows—(Report, p. 979)—“In 10 out of 31 experiments fleas caught on rats and guinea pigs in plague houses conveyed plague to fresh animals on the Laboratory.”

Again (p. 982), “In houses in which plague infected rats had been found animals protected and unprotected from fleas were placed. In 51 experiments fleas were found on the protected animals four times and on the unprotected 31 times, six of the unprotected animals died of plague, but none of the protected guinea pig. Exactly the same results were obtained in these Punjab villages as in Bombay.”

Again p. 985 from certain statistics given it is concluded “that plague showed no tendency to recur in houses during successive epidemics.”

We have thus briefly abstracted the main conclusions arrived at by the Advisory Committee in this valuable instalment of their report. We may add that this volume contains an enormous number of tables, figures, plates and maps which render it of extreme interest.

THE CONTINUATION OF THE REPORT

We understand that two more volumes or instalments of the report of the Advisory Committee are yet to follow, the next one will deal with seasonal prevalence of plague, with the bionomics of fleas and other miscellaneous subjects and a concluding instalment will sum up generally the conclusions arrived at by the work of the Committee. This summarising volume will be of especial value, and it is possible that it may appear as a separate publication.

A NEWLY CONSTITUTED COMMISSION

Meantime it is satisfactory to learn that Commission has been reconstructed and will continue to work at the many still unsolved problems of this disease.

SPECIAL ARTICLE

MOTOR VEHICLES FOR CIVIL SURGEONS

BY A NOVICE

(Continued from page 113)

BEFORE buying a car the first thing to have a really clear idea of is the amount you are prepared to spend on it, and it is just as well to know that the catalogue price applies to the car as it stands, chassis with tyres and the body, and that it includes no extras other than those specified. These usually amount to a few necessary tools only, though such an expensive extra as a magneto may be included in the specification. A hood, head, side, and tail lamps are all required, with a Stearns wheel, or, at all events, a spare outer cover and inner tube, spare valves, springs, nuts, bolts, etc., are essential extras, and the prospective purchaser may, therefore safely estimate for an outlay of from £50 to £100 over and above the catalogue price, according to the size of the car before it is fit to take and keep the road. I may here so far forestall the subject by fixing £200 as the very lowest limit for a useful 2 seated vehicle, while £350 would be very much nearer the total cost of a 4 seated car of moderate power.

A brief description of some (somewhat arbitrarily selected) cars may be given, only models of moderate power are included, and holding, as I do, a pronounced belief in the peculiar suitability of always in mesh-gear cars for medical men, they will be described first. I cannot vouch for the absolute accuracy of these descriptions, though I have spared no pains to ensure it as far as possible.

ADAMS HEWITT—Single cylinder horizontal engine placed in centre of chassis. Bore and stroke, 121mm by 152mm ($4\frac{1}{2}$ by 6 in). Develops 10 12 b h p at 1000 revs. By R A C rating 9 h p. Wheelbase, 4ft 8 in, track, 4ft 2 in. Chassis wt 9 cwt, tyres 750 by 85mm (30 by $3\frac{1}{2}$ in). 760 by 90mm (30 by $3\frac{1}{2}$ in) also fitted.

Special features. Patent epicyclic gearbox giving 2 forward speeds and reverse, all actuated by foot pedals. clutch combined with gear. Lubrication automatic by gear driven pump. Radiator gilled tubes. Extra heavy flywheel. Drive by central chain to live back axle. Ignition double, high tension battery and coil, and low tension magneto. Foot accelerator. Price with 2 seats £204, 10s and £215 5s. Side entrance 4 seats (detachable) £250. These include many extras. 3 forward speeds at an extra cost of £10.

Larger model, 12 14 h p. 2 cylinder vertical engine under bonnet. Bore and stroke 105mm by 120mm ($4\frac{1}{2}$ by $4\frac{1}{2}$ in). By R A C rating 13 7 h p. Wheelbase, 8ft 6 in, track, 4ft 2 in. Chassis wt 12 cwt, tyres 810 by 90mm (32 by $3\frac{1}{2}$ in). Special features as above except that gearbox gives 3 forward speeds, and drive is by propeller shaft to back axle. Ignition, high tension battery and coil. High tension magneto £20 extra. Price 4 seats £290. Manufactured at Bedford, England.

LOTIS—Smaller model 8 b h p single cylinder vertical engine under bonnet. Bore and stroke 114mm by 130mm ($4\frac{1}{2}$ by 5 in). Develops 8 h p at 850 rev p m. By R A C rating 8 h p. Wheelbase, 7ft, track, 4ft 8 in. Chassis wt 10 cwt 2 qrs, tyres, 30 by $2\frac{1}{2}$ in. Special features. Engine burns paraffin or petrol. Special pedal actuated epicyclic gear placed in front of live back axle giving 2 forward speeds and reverse, clutch combined with gear. Drive by propeller shaft to gear in front of live back axle. Ignition, high tension battery with coil. Specially designed wheel or tiller steering. Price 2 seats, £210, 4 seats £235. With larger wheels 40 in for colonial use £225 and £250. Larger model 10 12 b h p 2 cylinder V engine for petrol only. Bore

and stroke 95mm ($3\frac{1}{2}$ in) Develops 10 b h p at 1000 rev p m, can be accelerated to 1,500 revs By R A C rating 112 h p Wheelbase, 7ft 6in, track, 4ft 10in Chassis wt 12cwt, tyres 32 by $3\frac{1}{2}$ in 4 seats, price £275 Magneto extra Other features as above Manufactured at Coventry, England (Sturmev Motors)

CHAMBERS—Smaller model 8 b h p 2 cylinder horizontally opposed (?) engine Bore and stroke 66mm by 108mm ($3\frac{1}{2}$ by $4\frac{1}{2}$ in) By R A C rating 91 b h p Wheelbase, 6ft 3in, track, 4ft, tyre 28 by $3\frac{1}{2}$ in Special features Patent epicyclic gearbox placed on back axle, giving 3 forward speeds and reverse Drive by central chain Price, 2 seats, £190 Larger model 10 b h p Bore and stroke 95 by 114mm ($3\frac{3}{4}$ by $4\frac{1}{2}$ in) By R A C rating 112 h p Wheelbase, 6ft 6in, track, 4ft Chassis wt 11cwt, tyres, 30 by $3\frac{1}{2}$ in Special features as above 2024 Seats Price as (?) 2 seats £232 Manufactured at Belfast, Ireland

FORD, U S A—15 18 b h p 4 cylinder vertical engine Bore & stroke 95mm by 86 ($3\frac{3}{4}$ by $3\frac{1}{2}$ in) By R A C rating 223 h p Wheelbase, 7 ft, track, 4 ft 8 in Chassis wt of 2 seater $9\frac{1}{2}$ cwt Tyres 28 by 3 ins Special features Epicyclic gear giving two speeds forward actuated by side hand lever, and reverse actuated by foot pedal, clutch combined with gear Drive by encased propeller shaft Single transverse front spring Diagonal staying of frame with distance rods meeting in a ball and socket joint behind gearbox in centre of chassis Epicyclic gearing placed at top of steering pillar Flywheel acting as fan in front of engine Foot pedal actuated brakes on propeller shaft and rear axle Ignition high tension battery with 4 coils Price 2 seats Ford Junior 2 seats Price, £165 Ford, 2 seats, £185 3 seats, £195 4 seats detachable swinging front entrance £210 Side entrance with strengthened chassis, and wheelbase 7 ft 9 in, £245 High tension magneto about £20 extra Built in U S A English agents who also stock all spare parts, Perry Thornton & Schreiber Ltd, London

RILEY—Smaller model 9 h p 2 cylinder V engine placed in centre of chassis Bore and stroke 86 by 89mm ($3\frac{3}{4}$ by $3\frac{1}{2}$ in) By R A C rating 91 h p Wheelbase, 6 ft 6 in, track 4 ft 2 in Chassis wt 9 cwt tyres 700 by 80mm (28 by $3\frac{1}{2}$ in) Special features Patent always in mesh gearbox, giving three forward speeds and reverse actuated by side hand lever Automatically positions itself, obviating any necessity for feeling for gears or possibility of tumbling through them Clutch leather faced cone Drive by central chain to live back axle Lubrication by hand pump, oil then fed automatically to engine Adjustable valve tappets Ignition high tension battery and coil Magneto £10 10s extra Wire wheels detachable and interchangeable, £5 5s extra 2 seated, price £168

Larger model 12 16 h p V engine placed under bonnet Bore & stroke 102 by 127mm (4 by 5 in) Develops 12 h p at 900 revs, can be accelerated to 18 h p By R A C rating 128 h p Wheelbase, 8 ft, track, 4 ft 3 in Chassis wt $13\frac{1}{2}$ cwt, tyres 750 by 85mm (30 by $3\frac{1}{2}$ in) Special features Gearbox as above, actuated by side hand lever working in special "gate" Clutch patent metal to metal expanding, runs in oil and gives very gradual engagement Drive by propeller shaft to live back axle Well designed system of torque and radius rods Petrol and oil tanks on dash Lubrication by positively driven pump Handpump and sight dio feeds also provided Cooling thermosiphon with honeycomb radiator Foot accelerator pedal Brakes internal expanding Additional transverse back spring Ignition high tension battery and coil, high tension magneto £21 extra 2 seats, price, £236 5s 4 seats, swinging front entrance, £246 15s If detachable £5 5s extra 4 or 5 seats, side entrance with 32 by $3\frac{1}{2}$ in tyres, £273 70s Detachable and interchangeable wire wheels on any model £5 5s extra Made at Coventry, England

All these cars embody the peculiar feature so desirable in a car which has to start and stop frequently, viz., an epicyclic or always in mesh gear, which, besides

rendering them practically "foolproof" in this respect, makes them very easy to manipulate

The Adams Hewitt, described by the makers as the "pedals to push" car, is probably the simplest car on the market to drive, as all gear changes are accomplished by foot pedals, and the hands need not be removed from the steering wheel Though I have never seen one, I feel confident after studying descriptions of the control that I should feel perfectly at home on it without practice The smaller model has earned laurels in many open competitions, and the mechanism is simple and accessible from above The Lotus though not so well known, is on very similar lines, and is designed by a man who is one of the first living authorities on the art of motor car construction It is specially intended for use in India and the Colonies

The Chambers, though a comparatively recent car, has done exceedingly well in big trials The horizontal engine makes for smooth and easy running and the drive by a central chain on all models has certain advantages over a cardan shaft drive

The Ford also enjoys an increasing reputation, and it is a very simply and directly designed car Its performance in the Scottish trials last year showed that it is built for work and gave it a great vogue The later models have been strengthened and improved in many respects

The smaller pattern Riley is probably the best 2 seater for its price obtainable, its design is the outcome of many years' experience, and though unconventional in appearance, as it has no bonnet, it is an admirable vehicle for two It has done well in many competitions and has shown a great turn of speed The larger model, though more recent, has also won its spurs in open competition It embodies many ingenious devices only to be found on cars of much higher price Taking it all round it comes very closely to the ideal car for a medical man in India and is accessible and easy to keep in order The thermosiphon cooling, special clutch and detachable wire wheels not to mention the patent gearbox are all excellent features The latter will probably be far more widely adopted in the immediate future Magneto ignition could easily be added as an extra on all these cars, and the back seats in 4 seated models made detachable at a slightly enhanced cost, two additions well worth paying for

Of cars with sliding gears there is a still wider choice These I shall not attempt to describe in detail, but I may mention a few which come within the limit of price, which with reputation is the deciding factor in selecting them The majority are 2 cylindered, though two 1 cylindered, and a few 4 cylindered models are included

Cars with sliding gears 1 cylindered engines ROVER 8 b h p Bore and stroke 114 mm by 130 mm ($4\frac{1}{2}$ by 5 in) By R A C rating 81 h p Wheelbase, 7ft, track 4ft 1in Chassis wt 10cwt, tyres 30 by $3\frac{1}{2}$ in Price 2 seats, £210, 4 seats, front entrance, £235 Colonial model with wider track and larger radiator at slightly increased cost Special features Threes point suspension of engine and gear Ingenious automatic lubrication Very simple control by accessory foot pedal, which closes inlet and opens exhaust valves by a sliding cam It has a magnificent reputation, and is almost unique in being a standard production for some years Very silent and flexible for a single cylindered engine and simple to look after Manufactured at Coventry, England

DE DION—8 h p Bore and stroke 100 mm by 120 mm (4 by $4\frac{1}{2}$ in) By R A C rating 62 h p Wheelbase, 6ft 2in, track, 3ft 9in Chassis wt 8cwt, tyres 30 by $3\frac{1}{2}$ in Price, 2 seats, £230 Larger model, wheelbase, 6ft 6in, track, 4ft Chassis wt 10cwt Price, (?) 2 seats, £273 Both models as 4 seaters at extra cost Many original features in design, and have a worldwide reputation for excellence of material and wearing properties A make in short that should literally last for years All De Dion cars are numbered and certified, and in buying one second hand

the production of this should be insisted on, as many small cars have De Dion engines fitted and may be wrongly described as De Dion cars. Manufactured in France

2 CYLINDERED CARS WITH VERTICAL ENGINES

ALLDAYS—10 b h p Bore and stroke, 95 by 114 mm ($3\frac{3}{4}$ by $3\frac{1}{2}$ in) By R A C rating 11 3 h-p Smaller model Wheelbase, 6ft 6in, track, 4ft Chassis wt 11 cwt (?), tyres, 700 by 85 mm (28 by $3\frac{1}{2}$ in) Price, 2 seats, £220 10s, 4 seats swinging front entrance £231 Larger model Wheelbase, 7ft 6in Chassis wt 13 cwt (?) Ball bearings to road wheels Tyres, 760 by 90 mm (30 by $3\frac{1}{2}$ in) 4 seats side entrance price £273 Detachable back seats to above, £10 10s Magneto in addition to battery ignition £15 15s extra In place of battery £10 10s extra Colonial model used to be built with 4ft 6in track and larger radiator Side chain driven in place of shaft, £12 12s extra Has an excellent record for reliability and performance Embodies many ingenious devices which render it easy to keep in good order and make it very accessible A standard production for some years Petrol tank on dashboard Positive lubrication by gear driven pump in '08 models with gate change lever and many other improvements A thoroughly reliable car The colonial model comes very near the ideal for Indian motorist use Recently described in one of the motor magazines, as a car "with a reputation probably unique in its class" Manufactured at Birmingham, England

SWIFT—10 12 h p Bore and stroke 102 by 111 mm (4 by $4\frac{1}{4}$ in) By R A C rating 11 2 h-p Develops 15 b h p at 1200 revs Smaller model, wheelbase, 6ft 10 in, track, 4ft Chassis wt $10\frac{1}{2}$ cwt, tyres 30 by $3\frac{1}{2}$ in 2 seats, price £225 Larger model, wheelbase 7ft 9in, track, 4ft 4in Chassis wt $12\frac{1}{2}$ cwt, tyres 32 by $3\frac{1}{2}$ in on driving wheels $3\frac{1}{2}$ on front wheels Frame strengthened throughout 4 seats side entrance, price £285 Magneto in addition £18 extra Gate change lever, on '08 model A car with an excellent record for reliability and good workmanship Has consistently won the highest awards in open reliability trials of recent years Built on straightforward conventional lines Manufactured at Coventry, England

DARRACQ—Smaller model 8 10 h p Bore and stroke 90 mm by 120 mm ($3\frac{1}{2}$ by $4\frac{1}{2}$ in) By R A C rating 10 h p Wheelbase, 6ft 6in, track, 4ft Chassis wt 11 cwt, tyres, 28 by $3\frac{1}{2}$ in 2 seats, price, £199 Larger model 10 12 h p Bore and stroke 100 by 120mm (4 by $4\frac{1}{2}$ in) or 112 by 120mm (4 $\frac{1}{2}$ by $4\frac{1}{2}$ in) Short chassis wheelbase, 7ft 1in, track, 4ft 1in weight 14 cwt, tyres 760 by 90mm (30 by $3\frac{1}{2}$ in) 4 seats with swinging front entrance or detachable tonneau £270 Long chassis, wheelbase, 8ft 4in, track 4ft 1in Weight, 16 cwt 4 seats side entrance body, price £295 Tyres as above Either engine supplied on these models at same price Standard ignition high tension magneto Spring drive to clutch Change speed lever on steering pillar

Standard models built by a firm of great resources and experience, who early captured the market in India The number of Darracqs consistently running after long use and without trouble is a high recommendation for reliability and excellence of design and material

SIDDELEY—10 12 b h p Bore and stroke 102mm by 114 mm (4 in by $4\frac{1}{4}$ in) By R A C rating 11 8 h p Wheelbase, 7ft 6in, track, 4ft Chassis wt 12 cwt, tyres, 30 by $3\frac{1}{2}$ in 4 seats, price, £300 A new model this year, its reputation rests on that of the firm who build it Though higher priced than some other cars of similar power and accommodation, it is by no means so dear as others Drive by propeller shaft which is a new departure It is also interesting to note that the company who had given up manufacturing any except higher powered cars, have returned to this moderate powered model

4 CYLINDERED CARS WITH VERTICAL ENGINES

BELSIZE—15 b h-p Cylinders cast in pairs Bore 77 stroke 89mm by 100mm ($3\frac{1}{4}$ by 4 in) By R A C rating

196 h p Wheelbase, 8ft, track, 4ft 3in Chassis wt (?) cwt, tyres 32 by $3\frac{1}{2}$ in Side entrance 4 seats with high tension magneto ignition Price £285 Special features Thermosyphon watercooling Lubrication to engine positive by special dredger, with suction pump actuated by foot pedal to return any excess of oil in crank case Gate change gear lever Metal to metal cone clutch, Designed with a view to accessibility Higher powered model did well in Scottish trials last year Special provision for ease in adjusting wear in steering lock and setting brakes Pedal actuated on back wheels and hand actuated on transmission shaft, much the best arrangement

COVENTRY HUMBER—10-12 b h-p Cylinders cast in pairs Bore and stroke 35mm by 85mm ($3\frac{1}{2}$ by $3\frac{1}{2}$ in) By R A C rating 17 h p Wheelbase, 8ft, track 4ft Chassis wt $12\frac{1}{2}$ cwt, tyres, 30 by $3\frac{1}{2}$ in Price with side entrance 4 seated body £250 A new model this year New features pressed steel frame, Gate change lever Ball bearings throughout except in engine Built by a firm of wide experience and repute who were the pioneers of moderate powered and priced 4 cylindered cars

SHAMROCK—12 14 b h p Cylinders cast in pairs Bore and stroke 85mm $3\frac{1}{2}$ in short chassis Wheelbase, 7ft 6in, track, 4ft, long chassis 8ft 6in wheelbase, tyres 750 by 85mm (30 by $3\frac{1}{2}$ in) Price, 2 seats on short chassis £240 4 seats, on long chassis, £275 Thermosyphon cooling Positive lubrication by gear driven pump Brakes, foot and hand, both act on drums on back wheels Gate change lever A new model this year, reputation rests on that of the experienced firm who build it (Straker Squire & Co) Magneto £20 extra

STAR—12 b h p cylinders cast in pairs Bore and stroke, 83mm by 114mm ($3\frac{1}{4}$ by 4 in) By R A C rating 17 h p Wheelbase, 8ft 4in, track, 4ft 1 in Chassis weight, 13 cwt, tyres, 32 by $3\frac{1}{2}$ in With magneto ignition and side chain drive, side entrance, 4 seats Price £275 With propeller shaft, £15 extra Special features, positive lubrication Gate change lever Designed with a view to accessibility and simplicity Highly spoken of, and specially selected by the R A C, for teaching purposes, previous cars having stood the severe strain well The only moderate powered car with side chain drive as standard

All the above cars should be obtainable at an outlay of Re 5,000 to Rs 6,000 including extras, as 4 seaters with hood lamps and magneto ignition It would be futile to attempt to draw any distinction between their comparative merits, some are rather more costly per h p than others, but this may be counterbalanced by other merits The smaller 2 seaters would cost less both in initial outlay and somewhat less in upkeep The heavier ones would be rather more expensive in tyres, but the greater flexibility of 4 cylindered engines should render them lighter on tyres in use Unless otherwise specified they are all gear driven by propeller shaft, watercooling is by pump, and high tension battery ignition is the standard They are all standard makes by firms of experience and position, and should all prove thoroughly reliable and satisfactory in use

To any one desirous of a higher powered car at a slightly greater cost, say, from Re 6,000 to Rs 7,000 complete, the following are worthy of enquiry—14-16 h p Allday's, £325, 12-16 h p Chambers, £336, (epicyclic gear), 15 h p Coventry Humber, £350, 12-18 h p Lotus, £310 (epicyclic), 12 h-p Lancheester (epicyclic), £350, 12-14 h p Singer, £320, 14 h p Vulcan, £350 The following are a little more costly—14-16 h p Argyll, £375, 14-16 h-p Darracq £370, 14-18 h p Siddeley, £380, 15-18 h-p Swift, £380, while the 12-14 h-p De Dion and 20 h-p Rover are probably as good value as can be had in medium powered cars at a still somewhat enhanced cost, say, Rs 7,500, all told

Cost of upkeep—This is difficult to estimate with any thing like accuracy, but a rough estimate of running

expenses may be given, the uncertain factors being tyres, and, to a less extent, repairs. A 10—12 multi-cylindred car should roughly do 25 miles to 1 gall of petrol, and over long distances, perhaps nearer 30. Much, however, depends on the care with which the carburettor is adjusted, the load and the road. With continual stops and re-starting 20 miles to the gallon would be a safer estimate. Taking 12 to 15 miles as the daily average run, the monthly expenditure of petrol would vary from 18 to 22½ gallons, cost at Rs 1 4 to Rs 1 8 per gall, Rs 23 to Rs 35 per mensem. Lubricating oil and grease say, Rs 2 to Rs 5. Wages of a man or trained mistri, Rs 10 to Rs 25. Etceteras, Rs 5 to Rs 10. Total monthly running expense, Rs 40 to Rs 75. Tyres are a very uncertain item. Perhaps 3,000 miles may be taken as a good average life. They may last longer, but perhaps more likely not so long. The year's run 12 to 15 miles per diem amounts to 4,500 or 5,500 which practically means a new set of tyres every six or eight months, after the first six months. Standard pneumatics (inner tube and outer cover) cost, say, from £6 10s to £8 10s per wheel. Smaller sizes somewhat less. The average cost per mensem of tyres on this basis will approximately work out from Rs 50 to Rs 85.

Our estimate then stands as follows --

Petrol	Rs 23 to Rs 35
Oil, etc	, 2 to „ 5
Wages	, 10 to „ 25
Etc	, 5 to „ 10
Tyres	, 50 to „ 80
Total	, 90 to „ 155

Replacements and repairs on a new car should be trifling, but after a year's running some overhauling is desirable, this would bring the monthly total to say Rs 100 or Rs 170, respectively, and a rough estimate of Rs 125 to Rs 150 per mensem, for a moderate powered car consistently running would not in practice, I think, be far from the mark, though Rs 100 per mensem for the smaller 2 seater's should suffice. Tyres are clearly the chief item of expense which a little bad luck may multiply enormously. With the introduction of quick tyre removers, spare wheels and two new compounds, "Miraculum" claimed to seal all ordinary punctures, and "Blaes" which practically gives a solid tyre, not to mention detachable rims, the terrors of punctures are to some extent mitigated but the cost is added to. Care in driving is no unimportant factor in the life of pneumatics. If you will cut a dash, stop with the brakes hard down and always drive at speed in and out of season, you have to pay for your pleasure in tyres, if not in more costly ways.

There are, I gather three golden rules in the matter of avoiding tyre troubles — (1) Overtire rather than undertire a car. (2) Inflate to give comfortable running and not taut. (3) Purchase tyres direct from the makers or a reliable agency. I may elaborate these rules a little.

The *Autocar* recently gave a ready means of ascertaining if a car is properly tyred. 12 mm of tyre section is necessary for every 100 lbs of weight. Tyres of 3½ in section or 90 mm are then equal to a weight of 750 lbs per wheel or 3,000 lbs weight of vehicle. As the weight is not equally distributed, the rear wheels taking more, a loaded car weight of 2,600 lbs would probably be nearer the mark. This can only be tested on a big weighing table in practice. The running weight of a car weighing 17 cwt to 18 cwt with water, fuel, hood, lamps and spares, plus 5 cwt 2 qrs for four 11st passengers plus ½ to 1 cwt of baggage, 23 to 24½ cwt or 2,600 to 2,750 lbs. It is therefore, if anything, undertyred with a full load. Heavy pattern tyres cost more but will recoup the extra initial cost in the long run. The maker's directions are to inflate such tyres to 80 lbs on the driving wheels and 70 lbs on the front wheels. Numerous letters from private owners point to an inflation of 60 and 50 lbs, respectively, or

even less (certainly not more) as giving vastly increased length of life and added comfort. Old tyres when retreaded run from one third to one half the mileage of mileage of new ones. There is a market for old tyres somewhere. The moral needs no pointing.

The expense and comparatively short life of pneumatics seriously raises the question of solid tyres, which should run from 10,000 to 15,000 miles. Their first cost is probably heavier,* in addition they unquestionably create greater wear and tear in the car itself, and extra strong springs and shock absorbers may or rather *must* be added if they are used, and for use on Indian roads their adoption is doubtful. An expression of user's experiences would be instructive. Speed must be to some extent sacrificed in the interest of the car and mechanism generally, but immunity from punctures would be no inconsiderable asset. It is no good thinking of fitting them to a car which the makers will not recommend for the purpose. The Albion is, I believe, the only car in which they are fitted as the standard tyre.

The prospective owner should order the "Motor Manual" written by the staff of the *Motor* paper. The "Auto motor Handbook," is also a useful little booklet, on the subject of the choice and management of a car.

STEAM CARS—The principle on which the steam generating portion of the engine is constructed differs from that of the ordinary steam engine, in the latter steam is raised in a boiler or receptacle containing water, in the former it is raised by the admission of water to coiled pipes heated to a very high temperature. On contact with the red or white hot metal the water is flashed into steam, and the ordinary boiler is thus replaced by the so called "flash generator."

The great advantage of steam over petrol cars is their much greater flexibility and reserve of power. The costly and complicated gearbox absolutely essential on a petrol car is entirely eliminated from a steamer. In the latter the range of speed extends between say, 5 miles per hour gradually through infinite gradations up to 30 miles or more, and, moreover, this applies when running on any gradient in reason and not only on the level. Power better proportioned to the work to be done is in short the keynote to the advantages of the steamer. Thus, when climbing a hill on a petrol car you have perforce to change down to a lower gear, or, in other words, to reduce the call on the engine by lowering the speed of the driving wheels, in a steamer the pressure in the generator can be raised and the output of power can be increased with the necessity for it, by the simple movement of a small hand lever. The pleasure of jumping up a long stiff rise on a steam car has no analogy to tackling the same hill with successive reductions of gear and speed on a petrol driven car. But in the face of these real merits there are certain practical drawbacks to steam cars which may not unfairly be put thus: (1) Steam has not received the attention that petrol engines have, and the mechanism has not reached that pitch of perfection which has been attained in the multiple cylindered internal combustion engine. (2) The initial cost is greater. (3) They are more greedy of fuel and the steamer has yet to be put on the market which will counterbalance this expense by burning the cheapest grades of petroleum. (4) They take a few minutes warming up and are not practically instantaneously ready to start. Still I am credibly informed that petrol simply is not in it with steam, a statement I implicitly believe is true in many important respects. Until some of the above mentioned drawbacks have been overcome, the day of steam cars for the use of medical men has, I am convinced, to arrive. The two cheapest and yet reliable models are, I believe, the 10 h.p. Stanley

* First cost of (a) male solid tyres, rims and mounting for 32x3½ in pneumatic tyred cars £35 6s. Tyres £27 15s. Pneumatics £25 to £32 per set of four.

sterms, and American make, and the Bolsover, a recent English pattern. The Turner Messrs also sell a 2 seated model at £250, a greatly reduced price. Other cheap models seem to be little more than toys.

Finally, a few words about setting about buying a car. There are several ways of doing this. (1) Having decided on a certain make, write to the makers or reliable agents, state your wants, and after getting an estimate, place yourself blindly in their hands. Cars have nowadays reached such a high standard of excellence that in the purchase of any car of well known make it would be difficult to go wrong. The second way is to buy through the agency of an experienced friend, trusting him implicitly to make the best selection he can. These ways refer to new cars, or, at all events, to practically new cars, i.e., shopworn cars or those used for trial runs only. In buying a secondhand car greater circumspection is necessary, or you may find you have "bought a pig in a poke." If you buy from a friend whose car is constantly running, and who can explain its mechanism and peculiarities, you are as safe as you can be. But never knowingly purchase a secondhand car without an expert examination and trial run first. The only advantage of buying secondhand is the lower initial outlay. But even this advantage may disappear in a very short time with heavy repair and tyre bills, not to mention the mortification of getting no continuous use out of it. The disadvantages are that it will not be quite up to date, and unless certified to by an expert, may have been mishandled. If a secondhand car is decided on, be sure it is a standard make of a firm of repute. Such a firm has experience behind it and a reputation to maintain before it, and is not likely to give up building cars in the immediate future when replacements may be necessary. A further reason is that when you want to sell there should be little difficulty in disposing of it. A car built by a smaller or less well known firm may be every bit as good, but will not command the same price if the owner wishes to sell, and motor firms have a way of appearing and disappearing after an ephemeral existence, when it is impossible to get replacements except at a very heavy cost.

Finally, as an ounce of experience is worth more than a pound of theory, the object of these rather rambling articles will have been achieved if those who have the more valuable commodity at their disposal will give others the benefit of it, in the columns of the *I M G*.

Correspondence

KALA AZAR AND BLACKWATER FEVER

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—Colonel Lukis in his paper on blackwater fever in your February issue says "blackwater fever, as far as India is concerned, is only met with in the Terai and Assam, and in a few isolated districts in the Madras and Bombay Presidencies. Quinine, in large doses, is given to patients all over India, yet we never see it produce hemoglobinuria except in certain well defined areas." So far as this Presidency is concerned it should be clearly understood that blackwater fever occurs in only a few isolated cases in these isolated districts, i.e., Vizagapatam and Ganjam.

That there is some other factor or factors at work, no one will deny, quinine is within reach of every one in this Presidency, including Ganjam and Vizagapatam, but it is only the isolated case that gets blackwater fever.

Colonel Lukis says that this undiscovered factor is the Leishman Donovan body and then he gives reasons for his belief—his first contention (a) that "the distribution of blackwater fever does not correspond with that of malaria, it does not correspond very closely with that of the Kala azar or cachectical fever." This is at variance with facts in this part of India. Madras town is a hotbed of kala azar but no one, so far as I know, has ever seen a case of blackwater fever in a Madras patient. Such rare cases as we see here come from the Ganjam and Vizagapatam districts or Bombay and no case of kala azar, so far as I know, has as yet been reported

from Ganjam and Vizagapatam districts. Patients do get quite cured of blackwater fever, but can any one say the same of kala azar?

Yours, etc.,
W B BROWNING,

LT COL, I M S,
S M O Genl Hospl, Madras

PLEAS AND DISINFECTANTS

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—I am much interested in the valuable work of Dr W C Hossack on the pulicidal action of disinfectants reported from time to time in your paper. In Vol. XLII October 1907, p 360, he refers to certain difficulties in comparing results, and a reason assigned is the variable and in some cases unstable composition of certain disinfectants, of which he names Cyllin Izal and Phenyle. Of the composition of Izal and Phenyle I have nothing at the moment to say, but regarding Cyllin with which I have worked chemically and bacteriologically for nearly five years I would assure him that he may rely with the most implicit confidence on its constant composition, as the standardisation of its composition is a feature to which its manufacturers have paid special attention since its appearance.

Dr Hossack concludes that the ideal for plague purposes would be a Cyllin with the pulicidal power of the most potent samples of phenyle or a phenyle of the germicidal power of a Cyllin. I recommend him to try a mixture of equal volumes of Cyllin (Rider Walker coefficient 17.0) and ordinary petrol, which mixture possesses a Rider Walker coefficient of 10.5, and kills rat fleas and dog fleas as also plague bacilli most satisfactorily in England. Or as an alternative he might experiment with equal volumes of the same Cyllin and Benzol, which mixture gives a resultant Rider Walker coefficient of 11.3. Personally I prefer the mixture of Cyllin and Petrol. I shall look with continued interest for his results.

PUBLIC HEALTH LABORATORY,
KING'S COLLEGE, LONDON,
13th January 1908

Yours, etc.,
DAVID SOMMERVILLE,
B A, M D, & C

THE USE OF GLOVES IN SURGERY

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—With reference to the recent correspondence regarding the use of gloves in operation work, I should like to point out that there is one way in which gloves are undoubtedly useful. In the operation theatre many surgeons still prefer to work with bare hands, and such excellent antiseptic results can be, and are, obtained without any covering, that there is much to be said for this practice, to which personally, I still adhere, and the expense of gloves is also a drawback in a hospital without outside resources. But whatever one's opinion may be as to the necessity of keeping the hands from contact with a clean wound, there can be no question regarding the advisability of avoiding contact with a decomposing body in *post mortem* examinations. Thick rubber gloves last a very long time, if properly attended to, and I consider that they should be an obligatory item in the equipment of every mortuary. There are one or two points in their management that may be worth mention. In the first place, they should be thoroughly washed while on the hands in soap and water, after use to avoid contamination during removal and they should be kept in a 1:60 solution of carbolic acid in a dark place.

I am, Sir,
Yours faithfully,
A HOOTON,
MAJOR, I M S,

Service Notes

SURGEON GENERAL GREASY, I M S, of Bombay, will shortly go home on leave and will probably not return to India.

There will be a promotion on the Bombay and Madras sides, but in Bengal the block is a big one and will not be got rid of till the retirements which must take place about January and February 1910.

A CORRESPONDENT has suggested a scale of fees for civil surgeons practice which he thinks would suit all parties concerned, viz, fees to be at rate of one per cent of patient's pay per visit with a minimum of 8/- and a maximum of 32/- with a mileage rate of say 5/- for out of station work.

Doubtless this would suit with patients of the official class with fixed pay. Anything would be better than the present unfixed system, where the patients take the chances and in most cases the doctor suffers.

WE are glad to learn that the work so far well done by the recent Plague Advisory Commission is to be continued, and the Committee has been reconstituted with Major Lamb and Captain Glen Liston, I M S, as an advisory Committee and Captain Gloster, Captain Kundhru and Captain White, I M S, as working members. Work was to begin in February.

THE retirement of Lieutenant Colonel J. C. Lamont, M B, I M S, has been permitted from 10th March 1908. Lieutenant Colonel Lamont, after a very distinguished career at Edinburgh, entered the service on 1st October 1877, he served in the Lushai Expedition but soon entered civil employ and has been Professor of Anatomy in the Lahore Medical College for many years past.

THE King has appointed to the Consulting Staff of the Officers' Convalescent Home at Osborne, Sir Thomas Clifford Allbutt, F R S, Sir William Bennett K C V O, Lieutenant Colonel Sir R. Havelock Charles, I M S, Mr. Watson Cheyne, C B, F R S, Dr. David Ferrier, F R S, Dr. James Goodhart and Mr. Pearce Gould, M S.

COLONEL PAT. A. WEIR, I M S, goes home on leave in March 1908, and Colonel A. M. Crofts, C I E, I M S, acts as Inspector General of Civil Hospitals, C P. It shows how torridly slow promotion has been when an officer of 31 years service only is appointed to officiate in an administrative appointment. Colonel Crofts' first commission is dated 31st March 1877. In the R A M C (to take only officers serving in India) we find many officers promoted long before this period, e.g., Colonel Ellis first commission August 1877, promoted Colonel August 1904, i.e., at 27 years, Colonel D. E. P. Lloyd V C first commission August 1878, Colonel April 1905, Colonel Forman, first commission March 1880, promoted January 1906. Colonel Todd, first commission March 1880, Colonel April 1906, Colonel J. G. Harwood, first commission May 1880, Colonel June 1906. The last *pucra* Colonel I M S (D. French Mullen), entered the service in March 1877 and got promotion after 30 complete years.

THE following Lieutenants, I M S, are promoted to be Captains, with effect from 1st February 1908:

Arthur Francis Hamilton, M B, F R C S
Arthur Denham White, M B
Michael Foster Reaney, M B
Ralph Roper White
Norman Methven Wilson
John Stevenson O'Neill, M B
Mathew Robert Cecil MacWatters, M B
William Herbert Boalch
George Allick Soltau
John Cunningham, M B
Herman Falk, M B
Charles Joseph Ceppinger, M B

DEPARTMENT of Military Supply Gazette Notification No. 6 of 31st January 1908 is republished as under:

No. 9—An addition* having been made to paragraph 5 of the regulations published in Department of Military Supply Notification No. 16 of 1907 on the subject of study leave to officers of the Indian Medical Service, the paragraph in question will now read as follows—

5. The minimum period of leave granted solely as study leave shall be six months. Time spent on the journey to and from India by an officer whose study leave is not combined with any other kind of leave, will reckon as study leave but the allowance specified in rule 10 will be granted during the period of study only. An officer whose study leave is combined with any other kind of leave will, however, be required to take his period of study leave at such a time as to retain, at its conclusion, a balance of other previously sanctioned leave sufficient to cover his return journey to India.

THE undermentioned officer has been permitted by the Secretary of State to retire from the service, subject to His Majesty's approval, with effect from the dates specified—

Lieutenant Colonel James Barry Gibbons, Indian Medical Service, Bengal,—17th February 1908,

THE undermentioned officers are permitted to retire from the service, subject to His Majesty's approval with effect from the dates specified—

Surgeon General William Richard Browne C I E, M D, Indian Medical Service.—1st April 1908.

Lieutenant Colonel William Frederic Thomas, Indian Medical Service Madras,—6th January 1908.

Lieutenant Colonel Francis Wyville Thomson, M B, Indian Medical Service, Bengal,—28th February 1908.

THE following promotions are gazetted (G. of India 16 Feb.)

CAPTAINS TO BE MAJORS, I M S

Dated 29th January 1908

Chintaman Ramchandia Bakhle
Krishnaraj Vishnoo Kukdaj
Christophe Dering Daves
Clarence Barrymore Harrison, M B
Nicholas Percell O'Gorman Laloi, M B
Thomas Henry Symons
Ernest Reinhold Rost
Hugh Ainsworth, M B
Frank Addinsell Smith, M D
John Wolfran Cornwall, M D
Alfred Miller, M B
Frederick Arthur Lucas Hammond
Sydney Price James, M D
Peter Dee, M D

(Army Department Notification No. 74 of 1908, so far as it relates to the above officers of the Indian Medical Service is cancelled.)

This means that the previous notification, which placed the men with first commissions dated 29th July 1896 over the heads of the men dated 29th January 1896 is cancelled.

From this and previous notifications it appears that of the men who entered the service on 29 January 1896 the following have received six months' acceleration of promotion, viz— Majors Coolstane Clemens Black, J. C. Robertson, Rimmer, E. L. Peary, W. J. Niblock, and V. E. H. Lindsay and R. P. Wilson. The rest of the batch of 29 January 1896 has received ordinary promotion after 12 years. Of the next batch whose commission dated from 29th July 1898 the following have now received six months' acceleration of promotion viz—

Ainsworth, F. A. Smith, Cornwall, A. Miller, Hammond, S. P. James and Peter Dee, whose majorities now date as in the above notification from 29th January 1908 (instead of date due 29th July 1908).

This system of accelerating promotion is not a very satisfactory one, mainly because the opportunities are not equal. We would not be sorry to see it got rid of only that the R A M C have got it in a still more developed form.

The promotion of Captain R. F. Standage I M S, to Major I M S is antedated to 29th January 1907, i.e., he has received the six months' accelerated promotion.

THE following notification in the *Gazette of India* dated the 14th February 1908, means that at last we have got a properly constituted Bacteriological Department, in spite of the "antis" who are so strong in the present House of Commons.

The 14th February, 1908

The following officers are appointed to the Bacteriological Department—

1. Lieutenant Colonel D. Semple, M D, R A M C (retired), Director of the Central Research Institute, Kasauli.
2. Lieutenant Colonel W. B. Bannerman, M D, I M S (Madras), Director Bombay Bacteriological Laboratory.
3. Major G. Lamb, M D, I M S (Bengal), Director Pasteur Institute Kasauli.
4. Major J. W. Cornwall, M D, I M S (Madras), Director Southern India Pasteur Institute, Coonoor.
5. Major S. P. James, M D, I M S (Madras), Statistical Officer to the Government of India in the Sanitary and Medical Departments, *sub pro tempore*.
6. Captain W. G. Lister, M D, I M S.
7. Mr. F. M. Gibson, M B, Assistant to the Director Bombay Bacteriological Laboratory.
8. Captain E. D. W. Greig, M B, I M S (Bengal).
9. Captain W. F. Harvey, M B, I M S.
10. Captain S. R. Christophers, M B, I M S, Director of the King Institute of Preventive Medicine, Madras.

THE services of Captain W. T. Finlayson I M S, are placed temporarily at the disposal of the Government of the Punjab for employment in the Jail Department.

THE services of Captain A. H. Proctor, I M S, are replaced at the disposal of His Excellency the Commander in Chief in India.

COLONEL P. A. WEIR, M B, I M S (Bengal), Inspector General of Civil Hospitals and Sanitary Commissioner Central Provinces is granted privilege leave for two months and eighteen days combined with leave out of India for five months and thirteen days under paragraph 226 Army Regulations, India, Volume II with effect from the 12th March 1908.

* Denoted by a black line in the margin

* Also in a later *Gazette* Major R. P. Wilson, I M S

THE services of Major A Miller, M.B., I.M.S. (Madras), are placed at the disposal of the Government of Madras.

THE services of Captain D S A O'Keefe, I.M.S., are placed temporarily at the disposal of the Madras Government.

MAJOR J CHAYTOR WHITE, M.D., I.M.S. (Bengal), Chief Plague Officer, United Provinces, is appointed to be Sanitary Commissioner, United Provinces, *sub pro tempore*, with effect from the 20th January 1908.

ON return from leave, Major R P Wilson, I.M.S., Civil Surgeon, is posted to Bandwan, with effect from the 23rd December 1907.

CAPTAIN H B FOSTER, I.M.S., Officiating Civil Surgeon, is placed on special duty in connection with plague in Behar with effect from the 6th January 1908.

FIRST GRADE ASSISTANT SURGEON Babu Ganesh Chandra Mitra is promoted to the senior grade, with effect from the 4th December 1907, *vice* Senior Assistant Surgeon Babu Bepin Behari Gupta, retired.

CAPTAIN G O F SPALY, I.M.S., is placed on special duty under the orders of the Honble the Agent to the Governor General and Chief Commissioner in Baluchistan, with effect from the 1st December 1907, and until further orders.

CAPTAIN M WINDROSS, I.M.S., Civil Surgeon, Bhandara, C.P., was granted three months' leave from 15th March 1908.

ON the appointment of Major J Chaytor White, I.M.S., M.P.H., as Sanitary Commissioner, U.P., Captain R F Baud, I.M.S., was appointed Chief Plague Officer, U.P., and Captain G W Macdonald, I.M.S. was appointed Assistant Plague Officer.

THE services of the undermentioned officers are placed temporarily at the disposal of the Government of the Punjab for employment on plague duty, with effect from the dates noted against their names—

Captain H Halliday, M.B., I.M.S., forenoon of the 14th January 1908.

Captain J O'Leary, M.B., I.M.S., forenoon of the 17th January 1908.

Captain W F Byrne, M.B., I.M.S., forenoon of the 12th January 1908.

Lieutenant W D Wright, M.B., I.M.S., afternoon of the 23rd December 1907.

THE services of Captain E A C Mathews, M.B., I.M.S., are replaced at the disposal of His Excellency the Commander in Chief in India.

FIRST CLASS ASSISTANT SURGEONS D R Davies and C H Oman are promoted to the honorary rank of Lieutenants from 20th October 1907.

SENIOR ASST SURGEONS D A ELKINS, E P Clement and J A DeRessurrecio are promoted to the honorary rank of Captain.

THE following appeared in the *C P Gazette* of 1st February 1908—

ON return from deputation, Lieutenant-Colonel W A Quayle, I.M.S., is posted to Jabulpore as Civil Surgeon, and Superintendent, Linnatic Asylum.

ON relief by Lieutenant Colonel W A Quayle, I.M.S., Maj W D Sutherland, I.M.S., Civil Surgeon, Jabulpore, is transferred in the same capacity to Saugor.

UNDER Section 6 of the Prisons Act, 1894, the Chief Commissioner is pleased to appoint Major W D Sutherland, I.M.S., Civil Surgeon to the executive and medical charge of the Saugor District Jail.

ON relief by Major W D Sutherland, I.M.S. Captain W H Kennick, I.M.S., Civil Surgeon, Saugor, is transferred in the same capacity to Raipur.

CAPTAIN E W C BRADFIELD, M.B., I.M.S., has been appointed to do plague duty at Mahabaleshwar under the Superintendent of Mahabaleshwar, with effect from the afternoon of the 3rd January 1908.

MAJOR F SMITH, D.S.O., R.A.M.C. succeeds Major B H Scott, R.A.M.C. as Sanitary Officer, 2nd (R. Pindi) Division.

LIEUTENANT COLONEL J T W LESLIE, I.M.S., Sanitary Commissioner with the Government of India, was granted privilege leave for three months with furlough for seven months in continuation with effect from the 28th January 1908 or the subsequent date on which he may avail himself of it.

IN continuation of Notification No 731, dated the 9th of September, 1907, Major H Ainsworth, I.M.S., Civil Surgeon has been permitted by His Majesty's Secretary of State for India to convert the period from the 27th of July 1907 to the 11th of November 1907 of the furlough granted to him in Notification No 928, dated the 27th of October 1908, and extended by Notification No 728, dated the 7th of September 1907, into study leave.

MAJOR H AINSWORTH, I.M.S., on return from leave was appointed Assistant Plague Medical Officer, Lahore, with effect from 21st January 1908.

MAJOR J J BOURKE, I.M.S., Deputy Assay Master, Bombay, is, with effect from the 1st of February 1908, granted privilege leave for 1 month and 21 days and furlough for one year 10 months and 9 days in continuation.

LIEUTENANT H J K WALLIS Indian Army, is appointed to act until further orders as Deputy Assay Master, Bombay, *vice* Major J J Bourke, I.M.S., on leave.

MAJOR R F STANDAGE, I.M.S. (Bombay), an Agony Surgeon of the 2nd class, is posted, on return from furlough, as Residency Surgeon in Mysore.

COLONEL W G KING, M.B., C.I.E. I.M.S. (Madras), Inspector General of Civil Hospitals, Burma, is granted privilege leave for three months and in continuation leave out of India on private affairs for four months and 1 paragraph 226 Army Regulations, India, Volume II, with effect from the 21st March 1908.

LIEUTENANT COLONEL E FRENCHMAN, Inspector General of Prisons, Burma, will officiate for Colonel King.

MAJOR E WILKINSON, F.R.C.S., I.M.S. (Bengal), Deputy Sanitary Commissioner, Punjab, is appointed to officiate as Sanitary Commissioner, Punjab, during the absence on deputation of Lieutenant-Colonel C J Bamber, I.M.S.

LIEUTENANT COLONEL LLOYD JONES, I.M.S., has gone on furlough this year and Lieutenant Colonel F MacCutie, I.M.S., returns to Calcutta to his old post of Assay Master and remains till his retirement in August next.

CAPTAIN DENHAM WHITE, I.M.S., has been selected to accompany the Raj Kumar of Cooch Behar in his voyage round the world. It will be remembered that Surgeon (afterwards) Sir Benj Simpson, I.M.S., was for many years in charge of the present Maharajah of Cooch Behar during his minority.

CAPTAIN R W ANTHONY, M.B., I.M.S., is granted, from the date of relief, such privilege leave of absence as may be due to him on that date and eight months' study leave, in combination with furlough for such period as may bring the combined period of absence up to one year and seven months.

HIS Excellency the Governor of Bombay in Council is pleased to make the following appointments, pending further orders—

Captain E C G Maddock, M.D., I.M.S., on relief by Major V B Bennett, M.B., F.S., F.R.C.S. (Eng.), I.M.S., to act as Civil Surgeon, Kairwa.

Captain A G Sargent, M.R.C.S., L.R.C.P., I.M.S., on relief, to act as Civil Surgeon, Ratnagiri, *vice* Captain R W Anthony, M.B., I.M.S., proceeding on leave.

LIEUTENANT COLONEL H HENDLEY, I.M.S., Civil Surgeon, Rawalpindi, has obtained privilege leave for 2 months and 5 days and furlough in continuation thereof for 5 months and 19 days under articles 260, 233 and 308 (b) of the Civil Service Regulations with effect from the 12th of March 1908, or the subsequent date from which he may avail himself of it.

MAJOR H M EARLE, I.M.S., assumed charge of the duties of Civil Surgeon of Kangra, on the forenoon of the 28th of January 1908, relieving Lieutenant D C V Fitzgerald, I.M.S.

LIEUTENANT COLONEL F P MAYNARD, M.B., F.R.C.S., I.M.S. (Bengal), Professor of Ophthalmic Surgery, Medical College, and Ophthalmic Surgeon, College Hospital, Calcutta, is granted privilege leave for one month and 13 days, with study leave out of India for six months and 17 days, in continuation, with effect from the 11th March 1908, or the subsequent date on which he may avail himself of it.

MAJOR E O KINFALL, I.M.S. (Bengal), is appointed to officiate as Professor of Ophthalmic Surgery, Medical College, and Ophthalmic Surgeon, College Hospital, Calcutta, during the absence on leave of Lieutenant Colonel F P Maynard, M.B., F.R.C.S. (Bengal), on, until further orders.

THE Army Council has approved as additional members of the staff of Queen Alexandra's Military Hospital—Surgeon Major General A. F. Bradshaw, I.M.S., as Consulting Physician, and Lieutenant Colonel P. J. Froyer, I.M.S. (ret'd), as Consulting Surgeon.

MILITARY ASSISTANT SURGEON J. J. A. BRACHIO is appointed to be Resident Medical Officer, Eden Sanatorium and Hospital, Dajeeing, with effect from the forenoon of the 13th December 1907, *vice* Military Assistant Surgeon M. Galvin, transferred.

MILITARY ASSISTANT SURGEON M. GALVIN, Resident Medical Officer, Eden Sanatorium and Hospital, Dajeeing, is appointed to be Medical Officer at Serdah, Eastern Bengal State Railway with effect from the forenoon of the 16th December 1907, *vice* Military Assistant Surgeon J. J. A. Brachio, transferred.

MILITARY ASSISTANT SURGEON S. J. V. FOX is appointed to be Medical Officer at Katihar, Eastern Bengal State Railway, with effect from the afternoon of the 17th December 1907.

ASSISTANT SURGEON D. O'C. MURPHY officiates as Civil Surgeon, Raipur, *vice* Lieutenant Colonel Poynder, on leave, in addition to his other duties as Superintendent, Central Jail, Raipur.

CAPTAIN R. W. CLEMENTS, R.A.M.C., succeeds Lieutenant Colonel G. Raymond, R.A.M.C., as Sanitary Officer, 9th Secunderabad Division.

LIEUTENANT A. H. KNIGHT, I.M.S., succeeds Captain R. M. Carter, I.M.S., as specialist in prevention of disease at Ambala.

CAPTAIN M. F. WHITE, I.M.S., Assistant Surgeons P. T. Duckworth, Pereira, Hutton, Pinto, Orwood, and Hospital Assistants M. Parshad, K. A. R., Achari, and Hina Lal have passed the Elementary Standard Examination in Burmese.

MAJOR C. E. WILLIAMS, I.M.S., D.I.H., M.D., having assumed the office of the first Sanitary Commissioner for Burma on 15th January, Captain R. Kelsall, M.B., I.M.S., was appointed to be Health Officer, Rangoon.

CAPTAIN A. WHITMORE, I.M.S., is placed in charge of the Government Plague Hospital, Rangoon, *vice* Captain R. D. Saigol, I.M.S.

CAPTAIN W. S. WILMORE, I.M.S., Civil Surgeon, U.P., was on study leave from 24th July to 6th August 1907.

ON return from furlough Major G. T. Birdwood, M.B. (Cantab.), has gone back to Agra as Civil Surgeon.

MAJOR H. A. SMITH, I.M.S., is appointed Civil Surgeon of Mussoorie.

MAJOR A. GWYTHER, I.M.S., Officiating Civil Surgeon of Saran, is allowed combined leave for eight months, *viz.*, privilege leave for two months and ten days under article 260 of the Civil Service Regulations, study leave for three months and furlough for the remaining period under article 308 (b) of the Regulations, with effect from the date on which he may be relieved of his duties.

MR G. O. RANGER, Professor of Dental Surgery, Medical College, Calcutta, is allowed leave without allowances for seven months, under article 339 of the Civil Service Regulations, with effect from the 15th April 1908, on any subsequent date on which he may avail himself of it.

MAJOR W. W. CLEMESHA, I.M.S., D.P.H., on return from furlough, has been placed on special plague duty in Bilaspur, and has since been appointed to act as Sanitary Commissioner, Madras.

THE services of the undermentioned officers having been placed at the disposal of the Punjab Government they were posted as Assistant Plague Medical Officers to the stations named below, with effect from the dates shown against their names—

Lieutenant W. D. Wright, I.M.S., Jullundur—23rd December 1907, afternoon.

Captain W. F. Brayne, I.M.S., Jhelum—12th January 1908, forenoon.

Captain J. O'Leary, I.M.S., Jullundur—17th January 1908, forenoon.

Captain H. H. Halliday, I.M.S., Lahore—14th January 1908, forenoon.

LALA KHAZAN CHAND, Civil Surgeon, Muzaffargarh, has obtained privilege leave of absence for two months, under article 260 of the Civil Service Regulations, with effect from the afternoon of the 18th of January 1908.

SENIOR ASSISTANT SURGEON Miran Bakhsh Utard, in charge of the Civil Hospital, Sialkot, is appointed to officiate as Civil Surgeon of Muzaffargarh, with effect from the afternoon of the 18th of January 1908, *vice* Lala Khazan Chand, proceeding on leave.

LIEUTENANT W. D. WRIGHT, I.M.S., Assistant Plague Medical Officer, Jullundur, was transferred to the Gurdaspur district in the same capacity, with effect from the forenoon of the 23rd January 1908.

MAJOR C. H. JAMES, I.M.S., Medical Adviser, Patna State, has obtained privilege leave of absence for three months, and furlough in continuation thereof for one year and nine months, under articles 260, 779, 233 and 308 (b) of the Civil Service Regulations, with effect from the 15th of February 1908 or the subsequent date from which he may avail himself of it.

LIEUT COLONEL K. C. SANJANA, I.M.S., has applied for six months and 21 days combined leave from 1st April 1908.

LIEUT COLONEL H. THOMSON, I.M.S., Sanitary Commissioner Madras, has applied for 16 months' combined leave from 1st March or date of relief, Major W. W. Clemesha, D.P.H., I.M.S. from Bengal acts for him.

THE King has approved of the retirements of Lieut Colonel Waddell, M.B., C.B.C.F., I.M.S., from 21st October 1906, Lieut Colonel C. S. Rundle, I.M.S., from 5th May 1907, and Hon. Capt. J. C. Lawrence from 20th November 1907.

CAPTAIN G. A. JOLLY, I.M.S., has been selected to proceed to Japan for a two years' course of study.

COLONEL G. J. KEFIE, I.M.S., to be P. M. O., Sirhind and Jullundur Brigades, *vice* Colonel H. R. Whitehead, British Service, transferred.

Notice

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

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BOOKS, REPORTS &c., RECEIVED—

Minor Maladies (New Ed.) Williams (Baillière Tindall and Cox)
The Report of the Sanitary Commissioner, India
The Bacteriology of Diphtheria Nuttall and G. Smith (Cambridge Press)
Clinical Microscopy Pai and Ramchandrar
Keen's Surgery Vol. 2 (W. B. Saunders & Co.)
Modern Otology—Wales (W. B. Saunders & Co.)
Experimental Prophylaxis of Syphilis Wassermann (J. Wright & Co.)
Diseases of Genito Urinary Organs Green Brooks (W. B. Saunders & Co.)
Pancræas Mayo Robson and Jannidge (W. B. Saunders & Co.)
McCombs Diseases of Children (W. B. Saunders & Co.)
Alken's Hospital Training Methods (W. B. Saunders & Co.)
Leishman Donovan Bodies in Cimon Capt. Patton, I.M.S. (Sci. Memoirs, No. 31)
Lt. Col. Maynard's Ophthalmic Operations (Thacker, Spink & Co.)

LETTERS COMMUNICATIONS, RECEIVED FROM—

Capt. Barnardo, I.M.S., Calcutta; Capt. Delany, I.M.S., Arrah, Dr. Pease, Calcutta; Capt. Munro, I.M.S., Calcutta; Capt. J. G. Murray, I.M.S., Calcutta; Capt. C. Brodribb, I.M.S., Jhansi; Major E. A. R. Newman, I.M.S., Ranchi; Dr. E. Neve, Kashmir; Lt. Col. Adie, I.M.S., Ferozepore; Capt. Kenrick, I.M.S., Raipur; Brigade Surgeon Keegan, I.M.S. (ret'd), Tyrol, Austria; Capt. A. Nesfield, I.M.S., Purnea; Capt. Foster Reay, Rampur; Dr. Mitra, Kashmir; Major G. Lamb, I.M.S., Karaul; Capt. Saigol, I.M.S., Rangoon; Major Evans, I.M.S., Lahore.

Original Articles.

SOME REMARKS ON THE REPORT ON PLAGUE IN CALCUTTA FOR THE YEAR ENDING 30TH JUNE 1907

By GEORGE LAMB, M.D.,

MAJOR, I.M.S.,

*Late Senior Member, Plague Research Commission, Member
of the Advisory Committee for Plague Research
in India*

IN a report on plague in Calcutta for the year ending 30th June 1907, Dr. Hossack offers some pertinent criticisms of that portion of the work of the Plague Commission which has already been published. I propose in the following paragraphs briefly to deal with these criticisms, in the hope that I may be able to help this observer to accept in a more whole-hearted manner the conclusions to which the work of the Commission undoubtedly points.

I. Dr. Hossack is of opinion that plague cannot be transmitted from rat to rat in the presence of a small number of fleas. He bases this opinion on the experiments carried out by the Commission with single fleas, in which successful transmission was obtained only once out of 67 trials, and on the fact that in all the other experiments a considerable number of fleas were used.

It is, of course, *a priori* certain that the greater the number of infected fleas which bite an animal, the greater the chances of infection. There is also much experimental evidence to support this *a priori* conclusion, namely, the observations in godowns 2 and 4 described in Vol. 7, p. 429 of the reports*. In godown 2, in which abundant fleas were present, the epizootic killed 25 guinea-pigs in about a week, while at the same time of year in godown 4 in which only a few fleas were present, 68 days elapsed between the death of the first and last animal, the same number of guinea-pigs being present.

Again, some of the experiments made by the Commission show definitely that infection can be transmitted when only a few fleas are present. I refer to some of the observations in which fleas got in plague infected houses were transferred to healthy animals in the laboratory, *vide* Vol. 6, p. 482, Table IV, Nos. 34 and 35, Vol. 7, p. 439, Table II, No. 3, Vol. 7, p. 978, Table XXX, No. 2, Vol. 7, p. 980, Table XXXI, No. 10. In all of these successful infections less than 10 fleas were added to each animal. When we consider that not more than 32 per cent of these fleas (Vol. 7, p. 445) would be infected, the possibility of a small number of fleas being able to infect is certain. It may also be pointed out

that on many of the animals both running about and in cages which become infected in plague houses very few fleas were taken.

As regards the failures to bring about an epizootic in the godowns in the months of June and July, on which failures Dr. Hossack lays stress, the reason was more the high temperature which then prevailed than the paucity of fleas. At the time of the partially successful godown experiments carried out later on in the slack season (August—October), the temperature owing to the advent of the monsoon had fallen slightly and as well the flea population had somewhat increased. These points are further discussed in a paper on the seasonal prevalence of plague which has yet to appear.

While there is no doubt, then, that a few fleas coming from an infected rat can transmit the disease to healthy animals and that the chances of transmission increase proportionately with the number of fleas, it is to be remembered that in nature an enormous number of fleas infest moribund plague infected rats, often over 100 have been captured on a recently dead rat, *vide* Vol. 6, p. 482, Table III, Vol. 7, p. 439 (experiment in office in Hummin Street), and Vol. 7, p. 978, Table XXX. It is also evident from the observation recorded on page 439 Vol. 7, that the fleas soon leave the carcass of the dead rat and very quickly take to a healthy animal which passes near the spot where the rat died.

II. Dr. Hossack is of the same opinion as Galli Valerio, that there is at present no satisfactory direct evidence that men are sufficiently frequently bitten by rat-fleas to account for the number who die of plague. It is quite true, as the Commission have shown, that the rat flea is not an usual parasite of man. It is also true, as the Commission have demonstrated and as Dr. Hossack admits, that this species, in lieu of a more acceptable host, will bite man and even live on him for some considerable time.

The only question then to decide is, if in nature in the presence of an enormous rat mortality, the rat-flea will take to and bite man to such an extent as to be responsible for the human cases which occur. While Dr. Hossack is not satisfied on this point, I find no difficulty in answering the question in the affirmative. I am guided to this conclusion mainly by the following considerations—

First, there is no question that in plague houses guinea-pigs and other animals, either running free or in cages, when they become infected, do so as a result of being bitten by infected rat-fleas and by this agent only. The evidence on this point produced by the Commission is to my mind overwhelming, and I see no reason why these observations should not be transferred inferentially to man. Secondly, the rat mortality during a plague epidemic is enormously greater than the human incidence of

* [Vol. 7 and such references refer to the volumes of the *Journal of Hygiene* in which the work of the Plague Advisory Commission has appeared.—ED., I. M. G.]

the disease. Thus, in the village of Kasel—Vol 7, pp 940 and 944, during the plague season of 1906, there were only 75 human cases, while 253 plague infected and 89 putrid rats, which experience showed would be almost all plague infected, were examined. There is no question that all the human cases came under observation. There can also be no doubt that only a proportion of the rats which died of plague came to light. I think it no exaggeration to say that for every human case ten rats at least must have died of the disease. Thirdly, the Commission have shown both in Bombay and in the Punjab that the great majority of human cases are single cases in a house. The same observation has been made in Calcutta, namely, 90 per cent are single cases.

It would appear from these considerations that the chances of man becoming infected in the course of the rat epizootic are comparatively slight. This phase in the natural history of plague is adequately explained in the light of the flea transmission theory. The Commission have shown that the percentage of infected fleas rapidly diminishes from the third or fourth day after the flea has imbibed the blood of the plague rat. We have seen that the chances of infection being given by a single flea are slight and we have also seen that the rat-flea will not attack man unless forced to do so. Man would, therefore, only participate in the rat epizootic as it were, by an off chance. Were it otherwise, the mortality would be too awful to contemplate. While it is true, as noticed by Dr Hossack in Calcutta and observed by the Commission in Bombay, that men working in plague infected houses are not very liable to be bitten by fleas, our experience both in Bombay and in the Punjab is that on certain occasions, as we have described, especially if the rat mortality has been great and recent, men are readily bitten by rat-fleas on entering the houses. The ordinary immunity from bites is, however, easily explained by the fact, that plague workers as a rule enter only those houses in which a plague death has already occurred, or in which a plague case has been suffering for some days, that is to say, some considerable time after the rat mortality. In this interval the fleas have died, dispersed or been carried away by other rats. It is also to be remembered in this connection that the house, in which a plague case is discovered, is not always the house in which the infection was got. There is the additional fact that the chances of being bitten by fleas are very much less when a visit for a few minutes or hours only is made to a house than when the period passed in the house is longer. Moreover, the chances of being bitten are still greater when the time passed in the room is during the night hours, that is, at a time when persons are lying quiet and unconscious of insects crawling on them or biting them.

III Dr Hossack considers that the mechanism of transmission as suggested by the Commission is not satisfactory.

The Commission's conclusions as regards this problem are of the most cautious nature. After examining all available data and applying the experimental method to all possible mechanisms, they tentatively formulated the conclusion, that the possibility of infection by the feces of the flea being deposited on the skin and then being either injected by the prickles or rubbed into the wound made by the prickles has been demonstrated. But whether this is the usual process the Commission were unable to ascertain.

Dr Hossack has made a calculation from which he draws the conclusion that the number of plague bacilli in a droplet of flea feces is probably as a rule very small. In this connection he seems to me to put too little importance on the multiplication of the bacilli which goes on in the flea's stomach. In this organ the bacteria are subjected, during the plague season, to a temperature very suitable for growth and are given a regular supply of nutrient. Everything is in their favour for multiplication. A few bacilli, therefore, ingested with the rat's blood would in a few days have increased to many hundreds of millions. That the feces of infected fleas are full of plague bacilli can be easily demonstrated by the simple experiment described at the foot of page 404, Vol 7. In this connection it is also to be remembered that while the flea is sucking it is constantly squinting out feces from the anus. There, therefore, takes place a deposit of a mass of plague bacilli in the immediate neighbourhood of skin abrasions or even on the top of them. Unless it were that the flea injected the bacilli under the skin along with the saliva, I can conceive of no other method occurring in nature which would so surely bring living virulent plague bacilli in contact with a sufficient break in the continuity of the skin, as to allow of infection taking place.

Finally, even granted that it has not been definitely settled by what mechanism the rat-flea transmits its infection, this is surely no argument against the general thesis. No one disputes the transmission of trypanosomes by *Glossina* because the mechanism has not so far been demonstrated.

IV Dr Hossack, after examining all the evidence bearing on other sources of infection, besides the flea, arrives at the conclusion that this evidence is so contradictory that it seems probable that there are many modes of plague infection and that in the present state of our knowledge to limit modes of infection to the bites of *P. cheopis* is unsound.

I do not intend at this time to enter in detail into this question. I have elsewhere* summarised the work of the Commission, which

* The Etiology and Epidemiology of Plague. Calcutta. Superintendent of Government Printing, India. (Price 4 annas.)

bents on the various other possible methods of transmission from rat to rat and from rat to man. I have shown that the evidence definitely points to the exclusion, (1) of the transmission of infection by direct contact, (2) of the aerial transmission of infection, (3) of the transmission of infection through the soil, and (4) of the transmission of infection by means of food.

I hold that the observations of the Commission both in the laboratory and in the field which exclude the above methods of transmission are of a far more convincing and exhaustive description than have ever been attempted by any previous observer and that in consequence they are much more weighty. Until now observations of as searching and convincing a nature, pointing to other conclusions, can be brought forward, it seems to me that the results of the Commission's work must be accepted in preference to any previous conceptions, founded on insufficient data mostly obtained from laboratory experiment.

In connection with the food infection of rats, there is an error into which Dr. Hossack has fallen and which I should like to correct. He cites the chronic abscesses which the Commission found in the abdomen of several rats in the Punjab, and which he calls buboes, as evidence in favour of an intestinal infection and as a set-off against the finding in Bombay, that in 5,000 naturally infected rats no mesenteric buboes were observed. Now, the Commission were careful to point out (Vol 7, p 467) that while the pathology of these chronic abdominal abscesses was somewhat obscure, even those in the mesentery did not originate in lymphatic glands, in other words, they were not buboes. Further, they did not in the least resemble the abdominal lesion found in certain rats with a form of chronic plague induced by experimental feeding on plague-infected material. The discovery of these chronic abdominal abscesses, therefore, in no way invalidates the statement that in nature never has a mesenteric bubo been found in plague-infected rats, although many thousand rats have been carefully examined.

V. Dr. Hossack has come to the conclusion that in Calcutta *Pulex cheopis* is not nearly so numerous as it was found to be by the Commission in Bombay, and that in plague-infected houses there is a very great difference between these two cities as regards the number of rat-fleas present. Let us examine the data on which this conclusion is based.

(1) Using the same method as that employed by the Commission in Bombay, Dr. Hossack found that during the months of July and August, the non-plague season in Calcutta, the average number of fleas taken on 420 rats (*Nesokia bengalensis*) was 2.65 per rat. Dr. Hossack is further of opinion, but only from general observations not substantiated by any figures, that in the epidemic season there is no great increase in the flea population. Now, in Bombay during

the off-plague season the lowest average number of fleas in any month was 2.5 per rat on *M. rattus*, 4.2 per rat on *M. decumanus* and 2.9 per rat on all rats trapped. Further, during the season of the plague epidemic, the highest monthly counts worked out as follows—5.2 per rat on *M. rattus*, 13.9 per rat on *M. decumanus* and 6.8 per rat on all rats. It is to be noted that the averages are calculated on a very large number of counts, the number of rats dealt with per month varying from 767 to 2,087 *M. rattus*, from 198 to 489 *M. decumanus*, with a total number of rats between 3,216 and 5,183.

There is no doubt, then, that in Bombay there is a marked seasonal prevalence of *P. cheopis*. It might quite well be contended that the Calcutta figures were calculated on far too few counts, and that for this reason were not of sufficient accuracy to compare with those obtained by the Commission in Bombay. It might also be put forward that no comparison is justifiable, as the Calcutta counts relate to fleas on *Nesokia bengalensis* only, a rat which is so rare in Bombay that no separate enumeration of the fleas infesting it was possible. However, if we accept the Calcutta figures and compare them with those obtained in Bombay in the off-season, we find that the average number of fleas per rat is practically the same as the number which infest *M. rattus* in Bombay. From this comparison, the only one possible with the data available, there are surely no grounds for concluding that *P. cheopis* is commoner in Bombay than in Calcutta.

(2) During the epidemic in Calcutta in February and March, 1907, an enumeration was made of the fleas trapped on guinea-pigs which had been allowed to run free in houses in which a death from plague had occurred.

In 11 houses of this description a total of 19 rat-fleas were taken on the guinea-pigs, that is to say, an average of 1.7 fleas per house. The enumeration is compared with that got by the Commission in Bombay during the plague epidemics of 1906 and 1907, which may be tabulated as follows—

	Houses proved plague infected	Houses only presumably plague infected
Total No. of houses examined	40	102
Total No. of fleas taken	1,229	1,143
Average No. of fleas per house	30	11

As none of the Calcutta houses were proved to be plague-infected, Dr. Hossack contrasts then count of 1.7 with the count of 11 got in presumably infected houses in Bombay, and draws the conclusion that in Calcutta fleas do not abound in plague houses as they appear to do in Bombay.

It might again be put forward that the Calcutta average was based on far too few counts to justify comparison with the Bombay figure. While this is so, there are, however, other very

adequate grounds to account for the great difference. In Bombay (Vol 6, p 467, and Vol 7, p 436), the houses were selected with a certain amount of discretion, the object being to ensure that they were really plague infected. Thus, for the most part only those rooms were used in which two or more cases were suffering from the disease, or in which there was a history of dead rats having been discovered. In some instances at the beginning of the observations, we were satisfied if a dead rat, which had been proved plague infected at the laboratory, had been found alongside the building in which a plague case had occurred, the presumption being that the rat had been thrown out from the house. It was soon found, however, that such houses seldom or never yielded successful results. They were, therefore, omitted in the later experiments. Further, no house was used unless the occurrence which pointed to its being plague infected was of very recent date.

In Calcutta no such selection seems to have been made. A study of the table on page xxviii of Dr Hossack's report shows that in every instance but one only a single plague case had occurred in the house, that the guinea-pigs were not put in until after the death of the patient, who, in most instances, had been ill for several days before death, and that only in one house was there either any dead rats found or a history of recent rat mortality.

It is evident, therefore, that the Calcutta houses are in no way comparable to those so carefully selected and used by the Commission in Bombay. For this reason it is not surprising that the flea counts differed so much in the two cities.

VI One of Dr Hossack's general conclusions (p xxi) still requires comment. It is herein stated that the importance of *M. rattus* compared with other species of rats as a disseminator of plague has been greatly overrated.

Now, the Commission have shown that in the Bombay and Punjab villages *M. rattus* is the only rodent which need be considered in connection with the plague epidemic. It is almost certain that in the rest of the mofussil of India this rat has the same relation to plague as it has in the Bombay and Punjab villages. The interval between rat and human plague in places such as the Punjab where *M. rattus* alone is found closely corresponds to the interval between *M. rattus* and human plague in Bombay. Further, in Bombay City, although *M. decumanus* is very common and is as susceptible to plague as *M. rattus*, it was mathematically calculated from figures supplied by the Plague Commission that the correlation coefficient of human plague with the *rattus* plague of the second previous week was .9407 with a possible error of .0096. In short, from the data available an eminent statistician came to the conclusion that there is an extremely close relationship between the incidence of plague in man and plague in *M. rattus*, and that the

correlation between plague in man and plague in *M. decumanus* is probably spurious, depending on the correlation between plague in *M. decumanus* and *M. rattus*.

Surely, with such conclusions as these in front of us, conclusions which must hold at any rate for practically the whole of India, it is impossible to overrate the importance of *M. rattus* as a factor in the human epidemic. The importance of *M. rattus* lies in the fact that this species is essentially a house rat, living and breeding for the most part in the dwelling houses, where it finds ample shelter and food supply.

From what I know of Dr Hossack's writings I take it that he bases this conclusion as regards the non-importance of *M. rattus* on the results of the rat examination in Calcutta and on one or two small outbreaks which have been described in connection with plague in *M. decumanus*. On page 12 of Dr Hossack's "Account of the Rats of Calcutta" the following table showing the frequency of four species is printed—

1	<i>Nesokia bengalensis</i>	..	60	p c
2	<i>Mus decumanus</i>		26	p c
3	<i>Mus rattus</i>	...	14	p c
4	<i>Nesokia bandicota</i>			rare

It is evident that any such estimate of the relative proportions of the rat population must vary according as it is based on a census of rats found dead or trapped living, and if the latter, according to the places where the traps are set. Thus, in Bombay it was found that the proportion of dead *M. rattus* to dead *decumanus* was as 1 to 2, while of the total rats trapped in various situations this proportion was reversed, namely, 2, 3 to 1. Again, the proportion of trapped *M. rattus* to trapped *M. decumanus* varied enormously according to the situations where the traps were placed (*vide* Vol 7, pp 744 and 745). For example, in traps set in open spaces in Bombay the proportion was as 1 to 2, while with traps set on the 3rd floors of houses it was as 8 to 1.

Dr Hossack's figures are evidently based on a census of all rats brought in for examination. From them, therefore, no deduction can be made as to which is the common rat that lives with the people. We have still to be supplied from Calcutta with large figures based on trappings in various situations. We still wait a thorough examination, carried on for at least a year, of the plague infected rats in Calcutta, so that figures may be available from which may be calculated the correlation between plague in the different species and in man. Until these data have been collated, it is surely premature to speculate as to which species is responsible for plague in man. It is impossible to say that the relationship between the disease in rats and in man would show any difference to what obtains in Bombay.

Finally, I hold that Dr Hossack's criticisms have in no way shaken the broad conclusions to

which the work of the Commission undoubtedly points, but which have not yet been definitely formulated by the Commission as a body. Personally, it seems to me that until work of an equal value and founded on as large and comprehensive a basis as that done by the Commission points unmistakably to other conclusions, it is the proper and sound policy to expend the public moneys only on those prophylactic measures, which are founded on the facts, (a) that bubonic plague in man is entirely dependent on the disease in the rat, and (b) that infection is conveyed from rat to rat and from rat to man solely by means of the rat-flea

NOTE ON THE VALUE OF LARGE QUANTITIES OF HYPERTONIC SALT SOLUTIONS IN TRANSFUSION FOR CHOLERA

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AND

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In a paper read before the Medical Section of the Asiatic Society of Bengal in December last, and published in the *Indian Medical Gazette* for March 1908, one of us (L.R.) together with Captain J. W. D. Megaw, I.M.S., drew attention to the value, in cholera, of large intravenous injections of normal salt solutions, the quantity being controlled by watching the blood pressure, although unfortunately the good effect was frequently only very temporary owing to acute diarrhoea rapidly ensuing, and again reducing the blood pressure to a dangerous point within a few hours of the injection.

Previous examinations of the blood having shown the extraordinary degree of concentration of that fluid in cholera, so that over 8,000,000 red corpuscles may be present per cubic millimetre, and the sp. gr. may reach 1.070 or over, it occurred to one of us (L.R.) that the rapid recurrence of watery stools shortly after saline transfusions might in part be due to the sudden dilution of the blood by the normal salt solution (one drachm to the pint or 0.625 per cent). Having obtained the opinion of several leading English physiologists that stronger salt solutions might safely be administered intravenously, it was determined to try the effect of hypertonic ones in the treatment of cholera.

The unusual prevalence of the disease during the last three months has afforded a suitable opportunity for testing this hypothesis, so the strength of the solution used at the Medical College Hospital was gradually increased by Captain Mackelvie, on whom has fallen all the labour of carrying out the transfusions with the enthusiastic help of Assistant-Surgeon Sasi Ku-

mar Sen Gupta. The fact that Captain McCay had in the meantime shown that the normal salt content of the blood of Bengalis is nearer 1 per cent than 0.7, enabled us to increase the strength with more confidence. Finding that 0.95 per cent appeared to give more favourable results than the formerly used 0.625 solution, we raised the amount to 1.25, or just about two drachms to the pint, being thus double the original strength used for so many years in India and elsewhere.

We laboured under the disadvantage of working during an epidemic of the disease, when the number of cases admitted and the pressure of ordinary duties made it impossible to transfuse every case in which this measure was indicated. Nevertheless, the results have been so strikingly favourable that we deem it advisable, in view of the continued wide prevalence of the disease, to publish a preliminary account of our work, so as to enable the method to be tested by others, reserving a fuller account until a later period.

Briefly, it may be said that the number of deaths in the collapse stage has been greatly reduced, while rapid recurrence of the watery stools, with consequent renewed fall in blood pressure, is much less common after the hypertonic solutions than with normal saline. The fact that at one time 12 out of 13 consecutive cases and at another 11 out of 12 were discharged cured, is a striking testimony to the value of this method, but although the good results obtained have been very evident to all who have watched the cases, it will be well to give a few figures in support of these general statements, as we have now had no less than 72 cases under treatment since the use of the 1.25 solution was commenced.

On working out the cholera results month by month for a number of years past at the Medical College Hospital, the curious fact was observed that the mortality is almost invariably considerably higher during the first three or four months of the year than for the whole year. The table, therefore, includes both yearly mortalities and those for the first quarter. The first line shows the figures for the four years 1902-5 when subcutaneous and rectal injections were mainly relied on, intravenous transfusions being seldom done. The second line gives the figures for 1906, when Captain Megaw frequently transfused with normal salt solution, controlling the amounts by estimating the blood pressure, although the quantities injected were generally smaller than those now used. This year shows a reduction of the mortality for the first quarter from 72 to 58 per cent, and of the yearly mortality from 61 to 49 per cent. For the first quarter of the present year, during which hypertonic injections were given, the mortality has been but 36 per cent, or just one half of the old pre-transfusion years, while up to date of writing the mortality has been

only 33 per cent. It was not, however, until late in February that the 1.25 per cent solution was commenced, since which date 72 cases have been treated with a mortality of only 27.8 per cent. This rate includes both moribund cases, who died before transfusion could be carried out, and also a number of deaths from uræmia, mostly in patients admitted two or more days after the onset of the disease. These last two classes account for half of the actual deaths during this period. The number of uræmia cases is probably due to a much larger proportion of severe cases being tided over the collapse stage, just as diphtheritic paralysis increased when the antitoxin treatment came into general use. There were also the usual number of mild cases, in which rectal saline injections were retained and transfusion was not necessary.

It remains to be considered how far the unprecedentedly low mortality recently obtained at the Medical College may be due to an unusual mildness of the present outbreak. For this purpose I have obtained the mortalities of the cholera cases treated at the Campbell Hospital for a number of years past, which have kindly been worked out for me by Hospital Assistant Gouri Chandra Dey, with the permission of Major Vaughan, I.M.S. In the first place they show a mortality, during the last six years among 1,399 cases, of 63 per cent, which very closely approximates to the 61 per cent at the Medical College during the pre-transfusion period. Moreover, the death-rates at the two hospitals vary year by year in an exactly parallel manner in the two series, the high and low mortality years being identical, so that the Campbell Hospital figures can safely be taken as a control for our Medical College results. On working out the mortality for the first quarter of the present year at the Campbell Hospital, the rate was found to be somewhat lower than usual, namely, 55 per cent, which is still exactly double that obtained at the Medical College, since the double normal saline solutions were used. It may, therefore,

be safely concluded that the mortality has been halved by the method now being dealt with, and the most recent results promise some slight further improvement when it becomes possible to transfuse every suitable case.

The quantity of fluid injected into the vein is also of the greatest importance. One pint is usually quite useless, while two pints seldom fully restores the blood pressure. We now generally inject four pints at a time, unless the pulse becomes quite full and bounding in nature with a lesser quantity. As much as 7 pints of the double normal saline in two injections has been given with a favourable result. In one case even $6\frac{1}{2}$ pints failed to raise the pressure above 65 mm, and a fatal result ensued, advanced vaso-motor paralysis being evidently present, but such cases are fortunately very rare. Adrenalin also failed in these to raise the blood pressure for more than a very few minutes. We aim at reaching a pressure of about 110, this being about the normal maximum for a Bengali, according to Captain McCay. In most of our cases it was well under 50 mm at the beginning of the transfusion, and in a number of cases was too low to be estimated owing to absence of pulse at the wrist. In such severe cases we have found subcutaneous injections practically useless. Although the double normal strength is rapidly absorbed when administered under the skin, it has proved of little benefit except in mild cases and when frequently repeated, while resulting abscesses are particularly difficult to avoid in a damp tropical climate.

Messrs Downes Bros have made a silver canula with a stopcock and special clamp for one of us (L.R.) which can be tied in the vein, preferably the cephalic above the elbow, and repeated transfusions performed through it. In one patient at the European General Hospital was thus transfused four times through the same vein by Captain Murray, I.M.S., with a favourable result. In native patients it has been less successful owing to their restless habits. Sterile bulbs have been used for trans-

Table of Cholera Mortalities

	CAMPBELL HOSPITAL			MEDICAL COLLEGE HOSPITAL								
	Whole year			Whole year			1st quarter			1.25 per cent saline		
	Total cases	Death rate	Recovery rate	Total cases	Death rate	Recovery rate	Total cases	Death rate	Recovery rate	Total cases	Death rate	Recovery rate
1902-05				417	61.2	38.8	128	72.7	27.3			
1906-07	1599	63.2	36.8									
1908-07				117	48.7	51.3	17	57.9	42.1			
1908	169	55.0	45.0				82	36.1	63.9	72	27.8	72.2

NOTE—1902-05—very few transfusions

1906-07—many transfusions with normal saline at the Medical College only

1908—many transfusions with hypertonic saline at the Medical College only

fusion, but when only an open funnel is available it should be covered with aseptic gauze to keep out any dust from the air.

Uremia as a late complication has caused several deaths, but repeated dry cupping, with three cups simultaneously over each loin, has frequently proved of great service in re-establishing the secretion of the urine. Once the full blood pressure has been firmly established and the watery stools have ceased, hot air baths can be safely given if suppression of urine continues for long, without waiting for uræmic symptoms, and have apparently saved life on several occasions. No alteration has been made in drug treatment during these transfusions, so that the good results appear to be due solely to the copious intravenous injections of hypertonic salt solutions. Further investigations are being carried out, but at present we think that *two drachms to the pint is the best strength to use for this purpose*.

EPIDEMIC DROPSY OR BERI BERI IN EASTERN BENGAL *

By T. H. DELANY, M.D., F.R.C.S.I.,

CAPTAIN, I.M.S.

On the 14th January 1908 I was placed on special duty to investigate the causation of "beri-beri" in jails.

My instructions received from the Inspector General of Civil Hospitals, Eastern Bengal and Assam, were briefly to find out if there was any factor of causation common to the affected jails and not equally to the others, and I was to satisfy myself as to the diagnosis of the cases.

My experience of beri beri has been fairly extensive as I saw cases numbering, perhaps, five hundred, in the Tung Wah Hospital, Hong Kong, in 1900 and 1901, through the kindness of a Chinese Doctor, Chung Tung who had British qualifications. I also experienced a slight outbreak of beri beri in my Field Hospital section in Hong Kong, having 9 cases amongst about 60 followers. And I saw all the cases admitted to the Medical College Hospital, Calcutta, while Resident Physician in the year 1902 and part of 1903.

Realising that to set out on my tour without a good knowledge of epidemic dropsy would handicap me, I availed myself of casual leave to visit Calcutta in January and see cases of the disease in the Medical College.

I then started on a tour in Eastern Bengal and Assam and visited all the jails where cases of beri beri and epidemic dropsy had been reported, and visited a number of other jails in order to compare the conditions there with the affected jails.

The following is a tabular list of cases reported in six jails —

Noakhali	Beri beri	9	Nov 1906 to
Comilla	Epidemic	32	Nov 1907
	Dropsy		June to August
Chittagong	Beri beri	13	1906
	Ditto	3	1907
Sylhet	Beri beri	157	1905
	Ditto	1	1906
	Ditto	7	1907
Gauhati	Multiple Neuritis	11	1902
	Beri beri	3	1903
	Ditto	5	1904
	Ditto	2	1905
Mymensingh	Beri beri	2	1907
	Epidemic Dropsy	12	1907

Besides the above jails I also visited the District Jails of Shillong, Tezpur and Famlpur, and the Central Jails at Dacca and Rampur Boria.

At each place I made enquiries as to the presence or absence of beri beri and epidemic dropsy in the district, and examined any cases that were available locally.

Plan of this Report

I propose in this report to adopt the following plan —

PART I—"Diagnosis" will deal with the diagnosis of the disease prevalent in the districts and jails inspected.

PART II—"Causation" will deal with the causation of the disease.

PART III—"Results of Jail Inspections" will deal with all the possible local conditions that may influence the disease under consideration, viz the general hygienic state of the jail, previous outbreaks of dysentery, the diet of the prisoners and so on, which I think it unnecessary to refer to further here.

PART I

Diagnosis

I was confronted with certain difficulties in diagnosis as well as in ascertaining the causation of the disease which I deem it necessary to draw attention to here.

1 The lapse of time since the greater number of the cases occurred. The Sylhet outbreak (158 cases) occurred over 2 years ago. The Comilla cases (32) eight months ago, and there were very few cases available in any of the jails.

2 The imperfect, and I may write useless clinical notes, when available at all, which were usually made by Jail Hospital Assistants. Clinical notes there were sometimes, in which the number of stools were apparently accurately noted under each date but such points as anæsthesia, hyperæsthesia, paresis, paralysis, etc., were ignored.

3 A peculiar tendency on the part of Native Practitioners, Hospital Assistants, even Assistant Surgeons and laymen, both native and European, to call any and every disease beri beri which had dropsy as its most obvious symptom. One can hear beri beri spoken of glibly by all sorts of people, but if you ask them why the cases are not Ankylostomiasis or dysenteric hydræmia or even Bright's disease and Kala azar, one gets no satisfactory reply.

I found but one officer of the Indian Medical Service who had seen cases he felt certain were beri beri. Most of the other officers I consulted stated that they had seen innumerable cases supposed to be beri beri, which, on closer examination, came more rightly under the various headings Kala azar, Post Dysenteric Anæmia, Malaria Cachexia and Ankylostomiasis.

I consulted Dr J. Dodds Price who writes that in 16 years' experience of Assam he had heard beri beri spoken of, but though ever on the lookout for the disease, has never seen it, though he has frequently seen other diseases mistaken for it. Lt Col G. M. Giles, I.M.S. (ret'd), was deputed on special duty to investigate kala-azar in 1890 and unfortunately published his report with the heading "Beri beri or the anæmia of coolies" and therein described ankylostomiasis as part of beri beri. I fear a great deal of the confusion is traceable to this report. I may here state that I saw no case of beri beri nor one that I could assure myself had suffered recently or in the past from beri beri either in a jail or in any of the districts I visited.

I saw, however, some 46 cases said to be then suffering or have suffered from beri beri, most of which would

["This hardly states the point of view of Lt Col Giles quite fairly. Col Giles found a vast confusion about diseases in Assam in which dropsy and anæmia were prominent symptoms. He showed clearly that these cases were not what is ordinarily known as beri beri, and he emphasised the discovery of the share taken by the ankylostomiasis in producing anæmia. What was then thought to be malaria is now believed to be Leishman Donovan infection.—Ed. I.M.S.]

come more properly under the designation Epidemic Dropsy, a disease which resembles beri beri rather closely.

The diseases resemble one another in the following manner —

- (a) Both occur mostly in epidemics
- (b) The knee jerks are altered in each
- (c) Dropsy of various degrees occur in both
- (d) There is considerable cardiac disturbance in each dilatation and heart murmurs being present or palpitation and dyspnoea only
- (e) In each disease the Pericardium, Pleura, and Peritoneum, may contain fluid
- (f) In each there is frequently oedema of the lungs
- (g) Cutaneous sensation is disturbed in both diseases
- (h) Hyperæsthesia occurs in both (see later difference)

(i) In each disease motion is frequently disturbed or interfered with

(j) And in each disease death occurs with distressing Dyspnoea and Orthopnoea

But the diseases differ as follows —

(a) Knee jerks in beri-beri are at first and for a brief period (rarely over 48 hours) increased and painful and then lost in probably more than 95 per cent of cases

In epidemic dropsy knee jerks are diminished or lost in no more than 3 per cent of cases

(b) Anæsthesia is a marked feature of beri-beri and will be found in practically every case either in small patches or over extensive areas. In epidemic dropsy cutaneous sensation is lessened over the dropsical areas and not in patches otherwise than over dropsical areas but in this disease though cutaneous sensation is diminished, it is not lost and probably is only so diminished from mechanical interference with nerve termini by the effused fluid

(c) In beri-beri true paralysis occurs, with toe drop, wrist drop, paraplegia or paralysis of all four limbs

In epidemic dropsy various forms of paresis are simulated by mechanical obstruction around, joined by the effused fluids, the very weight of a swollen limb may cause a difficulty in using it. An ataxic gait is simulated owing to the swollen legs, and this may be more apparent when the external genital organs are swollen

But in beri-beri a characteristic symptom is the presence of varying degrees of paralysis in cases that have no dropsy whatever (dry beri-beri), and this occurs according to Hunter and Koch of Hongkong in quite 50 per cent of the cases, these cases having besides the characteristic patchy anæsthesia

(d) The hyperæsthesia differs in the two diseases being present in the dropsical skin and subcutaneous tissue when gently pinched in epidemic dropsy, but in beri-beri, the muscles are painful on moderate deep pressure in oedematous and non oedematous parts alike

(e) Some few cases of epidemic dropsy are found to undergo a general emaciation and so simulate the atrophic stage of beri-beri in which the muscles atrophy to such a degree that the patients look like living skeletons. But these cases of emaciation are able to move their limbs about in bed though they are feeble. In any large outbreak of beri-beri these cases of atrophy with extensive and severe paralysis are present in quite large numbers and are often bedridden for many months

(f) A marked feature of beri-beri is the sudden deaths that occur in addition to the distressing deaths with dyspnoea and orthopnoea, such as also occur in epidemic dropsy. These sudden deaths occur not alone in cases with paralysis and dropsy but in persons apparently well, or who have but the mildest symptoms

(g) There is some leucocytosis and anaemia (diminution of hæmaglobin) in epidemic dropsy, but in beri-beri anaemia is not present

(h) Of minor importance are the presence of rashes (subcuticular mottling and staining along the course

of superficial veins) with dry skin and slight desquamation and initial fever in epidemic dropsy

(i) Lastly, the symptoms of beri-beri are essentially those of peripheral neuritis and the central nervous system is unaffected in every case (Hunter and Koch, Manson, Braddon, Wright)

A careful examination of jail records and their reports and of any patients available as well as consultations with Jail Superintendents have convinced me that the disease beri-beri has not existed in the jails of the Province

I believe, however, that outbreaks of the disease before mentioned which so closely resembles beri-beri, viz., epidemic dropsy, have occurred and still occur in the jails and certain districts and that the term beri-beri has frequently been misapplied to these cases as well as sometimes to other diseases having dropsy as a symptom

Now, to prove these facts it is necessary to make an analysis of the cases reported in each jail

The Noakhali Jail Cases

Nine cases of beri-beri extending over a year from November 1906 to November 1907

The symptoms were —

(a) dropsy affecting the whole body in some and very slight in others

(b) Marked dyspnoea and orthopnoea in the fatal cases lasting 36 hours into several days before death and in those cases well marked pericardium effusion and in some pleural effusion and peritoneal effusions 5 cases died

(c) Heart all dilated

(d) Knee jerks absent or diminished in most

(e) No hyperæsthesia of muscles no anæsthesia, no paralysis, no muscular atony or atrophy. There were none of the extremely sudden deaths seen in beri-beri

With such complete absence of the symptoms and signs of peripheral neuritis it can hardly be doubted that the disease was not beri-beri

The Comilla Jail Cases

32 cases of epidemic dropsy occurred in the 3rd quarter of 1907

The Superintendent, Captain S Anderson, I.M.S., has made a complete analysis of the symptoms and signs in those cases. The physical signs of peripheral neuritis were absent and dropsy in some cases extensive, in others slight, was the main symptom

The epidemic character of the disease is shown by (1) the occurrence of so many cases (32) in a period of 3½ months, (2) the fact that 27 of the 32 cases can be traced to the upstairs main sleeping barracks. This is referred to later

I agree with Captain Anderson in considering these cases to be epidemic dropsy

Several similar cases occurred in Comilla Jail while I was preparing this report. These cases differed in no way from those previously reported, and five out of the seven cases were traceable to the upstairs sleeping barracks, to which the previous cases were traceable. See *I.M.G.*, (March 1908, p. 85)

The Sylhet Jail Cases

There were 167 cases of beri-beri reported in 1905—1 in 1906 and 7 in 1907

As there are not complete clinical notes of the epidemic of 1905 in the Jail records, I have made a tabular statement showing the symptoms described by Major E. A. W. Hall, I.M.S., in the May 1908 number of the *Indian Medical Gazette*. It is unfortunate, however, that Major Hall, in writing his monograph on the outbreak, did not discuss the diagnosis of the cases and that the symptoms are not treated exhaustively in his Monograph

If the symptoms are divided into General and Nervous, the former can be dismissed in a few words by stating that —

(a) Dropsy was a marked feature of about 2/3rds and slight pretibial oedema in about 1/3rd

(b) Dyseptic symptoms in all with acute gastric disturbance in 33

(c) Absence of albuminuria in all

(d) Palpitation, cardiac murmurs in 31

(e) Dyspnoea in most

It is more convenient to shew the nervous symptoms in tabular form as follows —

Nervous Symptoms in 158 cases

Knee jerks	Muscular hyperæsthesia	Anæsthesia	Cerebral	Paralysis
Markedly Diminished in 104	In the calves and arms 111	Protibial region 83	Coma fits & delirium in 5	Residual paraplegia in 4 (all died)
In some of these (number not stated) knee jerks lost		Tingling arms & legs very common	Delusion 3	Toe & wrist number not stated
Viz — Knee jerk present presumably in 34%	Viz — Hyperæsthesia absent in 30%	Viz — Anæsthesia absent in 47%	Viz — Severe Cerebral symptoms there fore in more than 3%	2 cases of dry beri beri
				Residual paralysis present therefore in only 24%

The knee jerks then were diminished or lost in 104 out of 158, cases so that they were presumably present in 54 cases or 34%. I consider that 34% of cases with normal knee jerks is much too high for beri beri. It is unfortunate that the proportion of cases where knee jerks were lost to those in which they were diminished is not stated, but the fact that some of these 104 had merely diminished knee jerks if taken in conjunction with the 54 cases which had normal knee jerks goes further to prove that we are not dealing with the condition of the knee jerks in beri beri. In this disease there is a slight increase of the knee jerks for a period varying from a few hours to at most a few days after which in nearly 100 of cases the knee jerk is quite lost.

In epidemic dropsy, on the other hand, the knee jerks are normal in from 50 to 70 of the cases and diminished or lost in probably no more than 30 to 50 cases.

Now take muscular hyperæsthesia.

It was present in 11 cases, that is, it was absent in 47 or 30%.

In epidemic dropsy there is no real hyperæsthesia of the muscles but all oedematous parts are hyperæsthetic even on gentle pinching. In testing for hyperæsthesia (or anæsthesia), one has to depend to a great extent on the sensations of one's patient who, if a prisoner, has every reason to exaggerate his condition. It is necessary therefore to test for alterations of sensation with extreme caution, and in the case of hyperæsthesia of muscles to apply moderate pressure with the hand and watch the patient's facial expression without asking a leading question. It was not possible to ascertain how far this was done in the cases under review.

In true beri beri muscular hyperæsthesia will probably be present at some time in the disease in nearly 100% of cases and its absence in 30% or 47 out of 158 cases is improbable.

There was anæsthesia in 83 cases. That is anæsthesia was absent in 75 or 47%. It is certain that sensation is disturbed in epidemic dropsy only to the same extent, however, as will be found in dropsical parts in other diseases. The disturbance of sensation is probably the result of purely mechanical pressure of the fluid on the terminations of the nerves and is mostly a diminu-

tion in tactile sensation of the oedematous parts rather than true anæsthesia or total loss in sensation. The greater the oedema, then probably the greater the alteration of sensation in the affected parts.

I might here quote the method of producing local surgical anæsthesia by subcutaneous injection of normal saline solution.

In beri-beri, however, true anæsthesia is present. It is not confined to oedematous parts; there are numbers of anæsthetic patches all over the body.

In the Sylhet Jail case, anæsthesia is mentioned as being pretibial in 83 cases viz., only 53%. In beri beri, anæsthesia is not confined to the pretibial region as stated above, and is present in practically every case either in patches or over extensive areas of the body.

Cerebral symptoms are not met with in beri beri. It is characteristic of the disease that the central nervous system escapes (Hamilton, Wright, Braddon, Manson) and coma, fits, delirium and delusions are not recorded in the literature of beri-beri.

In beri beri one of the most characteristic appearances in a hospital treating many cases is the number of patients who are helplessly paralysed, and whose muscles are in a degree of atrophy that gives them the appearance of living skeletons. In addition one sees all degrees of partial paralysis from the one who is only able to crawl about on crutches to one who has simple wrist drop. Moreover, quite a number of paralysed patients are met with who have not and had not at any time dropsy. There are the dry beri beri cases and form quite a marked proportion of the total, in fact, according to Hunter and Koch the dropsical and atrophic forms occur in about equal proportions in any given epidemic.

In the Sylhet cases only four out of 158 cases had what is called paraplegia. Toe drops and wrist drops are not mentioned as having occurred, and lastly, two cases only are returned as beri beri of the dry form.

Now, in epidemic dropsy no true paralysis occurs. Patients whose bodies are bloated with marked dropsy have a pure mechanical difficulty, which may be extreme, in bending their joints and using their limbs. Those with a less degree of dropsy walk often with their swollen thighs apart, especially if the external genitals are swollen, and raise their heavy limbs with difficulty, so as to present a series of pictures like the various forms of paralysis and ataxia. Further, some cases of epidemic dropsy (of which I saw an example) become so weakened and emaciated after a severe attack as to simulate atrophic paralysis, but they are rare.

The mode of death in beri beri and epidemic dropsy is similar in a number of cases, that is, with distressing orthopnoea for 24 to 72 hours or even more before death.

But in beri beri a characteristic form of death occurs with extreme suddenness and without any warning. A patient is seen say at 7 A.M. and states that he is quite well except that his stomach has been sick once or twice. You call to see a little later only to find he had died very suddenly perhaps soon after your previous visit. Moreover, it is characteristic of beri beri to find some of those very sudden deaths amongst persons who were not known to be ill and had made no complaint whatever.

In the Sylhet Jail no case amongst the 21 deaths occurred in this fashion, all had dyspnoea for several hours or days beforehand.

As to the *post mortem* appearances found in the 21 fatal cases, it is recorded that the—

(a) *Lungs* showed "some congestion and oedema in some."

(b) *Pleura*—single or double effusions (quantity not stated) in 16 out of the 21 cases.

(c) *Pericardium*—well marked effusion (pericardium distended) in 16 and rather less effusion in 5.

(d) *Peritoneum* more or less marked effusion in 8,

(e) *Blood and blood vessels*—signs of "great venous congestion, stagnation of the circulation and great fluidity of the blood"

All the above signs might apply equally to a description of the *post mortem* appearances of beri-beri and epidemic dropsy.

There are other facts bearing on the diagnosis of the outbreak in Sylhet Jail.

First—When Captain Steen took over charge of this Jail early in September 1906, there were a large number of prisoners in a special gang on light labour with their coats marked "B" to shew they were the sufferers from the previous outbreak of beri-beri.

Captain Steen found that none of this large gang, almost 100 prisoners, had nervous symptoms or symptoms of any kind, so he took off the "B" and put them on hard labour. Some two or three were thin and weakly and subjects of ill health otherwise. Now, the last case admitted in the previous outbreak was on the 1st January 1906, that is, eight months previously. It is to be presumed that many cases were seriously ill for three or four months, and it is common enough to see cases of residual paralysis going about for three or four months further or even more. But Captain Steen, as I have stated, saw no such cases.

Secondly—There were seven cases admitted to hospital for beri-beri in 1907 on the diagnosis of the Hospital Assistant who had experience of the 1905 epidemic. Captain Steen acquiesced in the diagnosis in expectation of the nervous symptoms which, however, never appeared. This Hospital Assistant was the permanent Hospital Assistant of the Jail, and during the 1905 epidemic was assisted by three others sent on special duty for the purpose. The work was arduous as besides the ordinary work this epidemic occurred in the short period of the last three months of 1905, and therefore, most of the observations and clinical notes on the cases had to be done by the Hospital Assistants. The point is then that no nervous symptoms appeared in those seven cases, and Captain Steen began to look on the diagnosis with suspicion.

Thirdly—There were 12 other cases of oedema of the leg in 1907 which Captain Steen kept under observation in expectation of the nervous symptoms which failed to shew themselves. Captain Steen no longer admitted cases of dropsy as beri-beri.

Fourthly—A disease said to be beri-beri has been prevalent in the district of Sylhet for many years, how many I could not ascertain, but it is over 15 years at least. One's sources of information are unreliable as the Medical Practitioners and lay people, though they speak glibly enough of beri-beri, cannot state how this disease differs from other diseases with dropsy as a symptom.

Captain Steen who has been Civil Surgeon for one and half years has seen innumerable cases in the district, always shewn to him as cases of beri-beri, though he failed on every occasion to find any nervous symptoms.

Fifthly—Assistant Surgeon Chandra Kumar Dutta, lived in Sylhet District for about eight years from 1898.

He states that he recognized almost from the beginning of his tour of duty in Sylhet that the disease then occurring endemically and epidemically in the district and in the Jail was epidemic dropsy and not beri-beri. He was led into this belief because he found that the knee jerks were present in most of the cases and there was never real anaesthesia or paralysis, although weakness of limbs was sometimes called paralysis, and no cases of dry beri-beri occurred. He saw some cases before death in the Jail, all of which died with severe cardiac dyspnoea and one, he remembers, died rather suddenly, viz, within a few hours, and he saw many *post mortem* examination of the cases, all of which had well marked pericardial effusion. Moreover, he states that he never saw a single case of beri-beri in Assam though frequently shewn cases so called.

Sixthly—I had the good luck to see five such cases kindly secured for me by Captain Steen.

One was a very advanced case of dropsy in a boy about 12 years old, the last of seven persons affected in his house, of whom two died of the disease. This case was certainly not beri-beri and would more aptly come under the heading endemic and epidemic dropsy. I saw four cases in one house, viz, the Compounder of the Charitable Dispensary Sylhet, his wife, his sister, and his younger brother, all of whom had the disease. The Compounder and acting Hospital Assistant called three cases beri-beri, but a most careful examination shewed the absence of nervous symptoms excepting some diminution of the knee jerks, so that I am sure the disease was not beri-beri and believe it was epidemic dropsy.

Seventhly—I would draw attention to the account of epidemic dropsy in Allbutt's *System of Medicine* and Manson's book on *Tropical Diseases*, in which it is stated that the disease overran Sylhet in 1878-79.*

As far as it was possible for me to ascertain from enquiries, I believe it is quite probable that the same disease has remained in this district for the 20 years since that historical epidemic. It apparently is more prevalent some years than others, but its identity has been almost obscured owing to the constant misuse of the term beri-beri to include any disease with dropsy as its main symptom, and to the fact that epidemic dropsy is also called cardiac dropsy, anaemia, etc.

I feel I am justified on those facts in concluding that the epidemics in Sylhet Jail were not beri-beri and the disease was in fact epidemic dropsy.

Now take the Chittagong Jail. Here there were 13 cases of beri-beri (with two deaths) in 1906 and three cases in 1907.

Chittagong is the port of the Province of Eastern Bengal and Assam and is growing in importance every year. Cases of undoubted beri-beri do appear in the port, all arriving in the ships. The new ship *Glan Sinclair* brought 7 cases one day in January this year.

That beri-beri should appear in the jail is not to be wondered at then.

But I would draw particular attention to the fact that here we have a jail differing in no way as far as one can judge from other jails in the Province in its sanitary condition, dietary, etc. Yet it has never experienced a serious epidemic of beri-beri, though it is at a port where this disease is frequently seen.

I was able to secure clinical notes of the 3 cases of beri-beri admitted in 1907 and think it worthy of notice that even in the jail of this port there appears to be some uncertainty of what constitutes the disease beri-beri, because the 3 cases under reference can hardly be cases of that disease, as a reference to the clinical notes shews that "2 of them were 21 days in hospital and one 13 days, and none of the cases had toe drops, rax, anaesthesia, though one case had pain in the knee joints and not actual hyperaesthesia." Again, from the clinical notes of one at least of the 13 cases of 1906 it is quite evident that it was not a case of beri-beri.

I saw a case in hospital admitted the morning of my arrival.

This prisoner had then been seen by the Jail Hospital Assistant only, who informed me on arrival that he had a case of beri-beri to shew me. A careful examination shewed that it was not beri-beri, as the cardinal signs of peripheral neuritis were totally absent, though there was no knee jerk. Now, I may fairly ask if there is uncertainty about the diagnosis in the Port of Chittagong, can anyone wonder at the misconception of what constitutes beri-beri at distant inland districts like Sylhet, Shillong, etc.

Now, let us investigate the cases in the Gauhati Jail. There were 11 cases of peripheral neuritis reported in

* These accounts are all based on papers in this Gazette in 1879-80, etc.—ED., I. M. G.]

1902. Three cases of beri beri in 1903 Five beri beri in 1904, and two beri beri in 1905

There are no clinical records in the jail of the 1902, 1903 and 1904 cases

There were some scanty notes of one case that occurred in 1904 and remained over to 1905 This was undoubtedly a case of post dysenteric dropsy

The notes of one of the cases in 1905 showed that he spent nine days in hospital and had no symptoms of peripheral neuritis though diagnosed, and returned as a case of beri beri

There were notes of two other cases of beri beri which suffered from dysentery severely for several months in 1906 In those cases marked paraplegia, wrist drop, pain and swelling of all the joints, and hyperæsthesia of the muscles developed after some months of suffering with dysentery There is no mention of anæsthetic patches, and no mention of dropsy in those cases, so that I cannot state whether there were cases of beri beri Thus of the 4 cases whose clinical notes are available, 2 were not cases of beri beri, and 2 were probably not cases of beri beri

Although no case of beri beri has been reported from Shillong Jail the disease was said to be prevalent in the districts I was lucky enough to see 13 cases secured for me through the kindness of Major Green by the Assistant Surgeon and private practitioners These 13 cases were first attacked in periods of from 9 months to 2 months previously About half the cases had slight oedema of the pretibial region and the rest had practically recovered from the disease In other words, the cases were still in such a condition that if suffering from, or, having suffered from beri beri, some of the cardinal nervous symptoms would still exist But a most careful examination made by Major Green and myself, showed the most complete absence of anæsthesia, muscular hyperæsthesia, paresis, muscular atrophy or atony Although the knee jerks were markedly diminished in four, absent in one and present in the remaining eight Yet I was assured by the patients themselves (who were mostly English speaking Khasias) and by the native practitioners who attended them, that they were then suffering from or previously suffered from beri beri

A native practitioner present who had helped to secure some of the cases assured me that he had seen over 100 cases in private practice in 1907 and over 20 cases in 1906 and believed them all to be beri beri and similar to the cases he then showed me He had not seen cases of anæsthesia, paralysis (except once) or very sudden deaths, but all his cases had dropsy, well marked dyspnoea (especially noticed here owing to the hill climbing necessary to get about)

The Civil Surgeon had seen cases occasionally shewn to him as beri beri, but he had never seen the marked anæsthesia and paralysis and was never quite satisfied with the diagnosis of beri beri There were 7 cases in 1907 and 2 cases in 1906 treated at the outdoor of the Charitable Dispensary for beri beri I could not obtain full details of these cases from the medical officer in charge, but he believed they were cases of beri beri although he did not remember to have seen cases of paralysis amongst them

I cannot resist the conclusion that the disease so called beri beri is not that disease in Shillong and is in fact epidemic dropsy in the majority of cases I will shew further on in this report how epidemic dropsy is introduced into Shillong from Sylhet, vide Part II

In the March 1904 number of the *Indian Medical Gazette* the Revd G C Crozier, M.D., reported 18 cases of beri beri in the Garo Hills and adds that there were several other mild cases

The symptoms and signs there described are typical of the disease epidemic dropsy In fact, a careful analysis shews the complete absence of the combination of symptoms which make up the condition Periphara Neuritis

The pseudo nervous symptoms I have already drawn attention to under epidemic dropsy were present, thus—*Knee jerks* were lost in 4 or 5, reduced or slow in 3 or 4, and quite normal in the rest of the 18 cases, viz quite 50% A *true anæsthesia* not noted—only some slight dulling of cutaneous sensations in the calves

There were many complaints of subjective sensations, tingling, etc., not diagnostic

No *true paralysis*, no ankle or wrist drop, no paraplegia noted, but tired feelings and difficulty of moving the swollen limbs were noted

No cases akin to dry beri beri, no residual atrophic paralysis, no appallingly sudden deaths, such as seen in beri beri

The heart conditions such as occur in both beri beri and epidemic dropsy are noted and all the deaths were preceded by orthopnoea

These cases are very similar to the Sylhet cases and, in fact, to most of the cases of so called beri beri in Assam

Before I sum up my conclusions on the diagnosis of outbreaks in the Jails of the province I wish to refer to a point bearing on the diagnosis of both beri beri and epidemic dropsy, I mean the *knee jerks*

Having heard it frequently stated that a given case is or is not either disease because of the condition of the knee jerks I thought it would be instructive to test the knee jerks, of a number of perfectly healthy prisoners in different jails then working in the sheds on hard labour I examined 750 prisoners from 8 different jails and classified the knee jerks as (a) present and active, (b) exaggerated, (c) absent, (d) diminished I used the rubber ringed end of a wooden stethoscope to strike the ligamentum patella and took great precautions to have the leg in a relaxed and hanging condition, rejecting all who were too stupid to assist in the experiments, and using various devices to get the attention of each off his legs, if necessary, using the method of reinforcement

The following table shows the result —

JAILS	Number examined.	(a) Present and active	(b) Exaggerated	(c) Absent	(d) Diminished
Comilla Jail	50	72%	6%	5%	17%
Chittagong Jail	50	66%	8%	6%	20%
Sylhet Jail	50	68%	14%		18%
Gauhati Jail	50	84%	4%	4%	8%
Mymensingh Jail	50	68%	4%	7%	17%
Dacca Jail	100	66%	6%	8%	20%
R. Bhoir Jail	280	82%	1%	1%	16%
Fairdipur Jail	120	78%	4%	2%	15%
	750	73%	6% nearly	4% over.	16% over

If then, knee jerk is absent in over 4% of healthy prisoners working at hard labour and diminished in over 16%, making a total of over 20%, it should make one pause before placing implicit reliance on the knee jerks as a point in diagnosis, at least among prisoners

To summarise the result of my investigation of the disease called beri beri in the jails (and I believe also in the districts) of Eastern Bengal and Assam

(1) I believe there is no beri-beri in the jails of districts of Eastern Bengal and Assam, and none of the outbreaks of recent years were beri beri

(2) I believe there is, and has been, year after year, outbreaks of a disease resembling beri-beri, the more correct diagnosis of which would be epidemic dropsy

(3) I believe that epidemic dropsy has probably existed more or less in Sylhet and Shillong since the epidemic of 1878-79

(4) I consider that there is great confusion in Assam as to what constitutes beri-beri and that any of the many diseases having dropsy as a symptom is liable to be called "beri-beri" in Assam.

PART II

Causation of Epidemic Dropsy

In order to find some factor of causation in affected jails that did not exist in unaffected jails I made a thorough inspection of the conditions prevailing in each jail which might in any way influence the prevalence of this jail.

I think it would be inadvisable to enter into a prolonged discussion on the factors which, I believe, in no way influence the disease and will therefore dismiss such considerations as the general sanitary condition of the jails, the water supply, consistory arrangements, forms of labour, etc., and I will briefly dwell on some other factors, viz

(a) Preceding Dysentery

It is believed by some persons that the outbreaks of epidemic dropsy were really cases of Post Dysenteric anæmia or hydiæmia and Comilla Jail is quoted as the best example.

The sequence of events in Comilla Jail was—

15 6 07	1st case of dropsy, 0
30 6 07 to 23 7 07	Epidemic of dysentery 15 cases
24 7 07 to 30 8 07	Epidemic of dropsy 31 cases

Only one case of epidemic dropsy had dysentery in the preceding dysentery epidemic and one case had dysentery four months before.

Here then we have only an accidental sequence of events and not the action of cause and effect.

Taking the Sylhet cases again only one of the cases of so called beri beri had dysentery previously in the jail, and there was no outbreak of dysentery in the jail before the epidemic of beri beri occurred. In fact the dysentery returns are lower for 1905 than for many years, being for instance 100 in 1905 and 158 in 1907.

(b) Nitrogen starvation

It is believed that the dry husked Burma rice is deprived of its nitrogenous envelope and also that owing to high prices prevailing of late, less nitrogenous food is partaken such as dals, meat and fish.

But a sufficient argument against this theory is that these conditions prevail over a vast area of India, but epidemic dropsy is, by no means, a widespread disease.

(c) The Burma rice theory

According to this theory the disease is due (in diverse manners) to the sating of Burma rice, and does not affect those using country rice.

If this theory is correct Government may in time be compelled to order the exclusion of Burma rice from jails and other institutions, a change which will be very costly to Government and almost ruinous to Burma.

Burma rice is used extensively in the jails of Eastern Bengal and Assam. Complaints are constantly being made about its keeping qualities especially in the damp climate of this Province.

There is no doubt Burma rice requires more care in storing than country rice, but such care as it requires is easily given to it in jails where labour is so cheap.

It requires constant sunning and should not be stored for a longer period than a few months in gunny bags.

My friend, Major A. R. Anderson, I.M.S., who had considerable experience of Burma rice in the Andamans, states that it is best stored in metal or metal lined wooden bins and not in bags.

Burma rice was used for ten months in 1907 in the Central Jail, Rampur Boalia. It is in constant use in Dacca Central Jail, and also I learn in Alipore Central Jail in none of which jails epidemic dropsy or beri beri have appeared, and it is used in the greater number of the jails of Eastern Bengal and Assam where no outbreak of these diseases has occurred, as well as extensively by the populations of the large towns all over the Province.

I learn from Major A. R. Anderson, that during a stay of five and a half years at Port Blair, he never met

with a case of beri beri or epidemic dropsy although Burma rice was used for full diet all the time, and this in spite of the fact that there were prisoners from every part of India.

Again, assuming I am correct in my belief that the epidemic outbreak in Sylhet Jail in 1905 was epidemic dropsy, it is curious that this jail never has used Burma rice and uses only rice freshly husked in the jail from paddy bought in the district.

I consider then that the charge against Burma rice is unfounded.

(d) Dal poisoning

It was suggested to me in some jails and districts that Mashkhalai dal was the cause of the outbreaks of beri beri or epidemic dropsy.

But Mashkhalai dal has never been used in Sylhet Jail or Gauhati Jail. It is in constant use in Dacca Central Jail and frequently used in Rampur Boalia Central Jail. It is in constant use in jails and districts where neither disease has appeared and cannot generally be associated in other parts of India with disease.

My own theory of the nature and causation of the disease which I propose to support with some convincing evidence is—

That epidemic dropsy is a specific infectious or bacterial disease.

And that it is conveyed from person to person by bed bugs.

It has been suspected to be a bacterial disease on account of—

- (1) Its epidemic character
- (2) The initial fever
- (3) The rash or rashes
- (4) The local or house infectiousness
- (5) And the sudden disappearance of the disease when infected houses are vacated.

The proofs I offer of its conveyance by bed bugs are—

1. The well known manner in which the disease affects households.

Examples of this are innumerable. Colonel Kenneth McLeod quotes numerous cases.

Major Leonard Rogers, in the July 1902 number of the *Indian Medical Gazette* mentions some good examples in an outbreak of epidemic dropsy in Calcutta in 1901.

(1) Fifteen persons out of seventeen affected with the disease in a house in Tamer's Lane, Calcutta.

(2) Twelve persons in a household (including servants) of 15 persons in a house in Muldun Mitter's Lane, Calcutta.

(3) Six out of seven persons, in a house in Shibnayan Das' Lane.

(4) My own experience in Sylhet and Shillong bore out this house infection.

(a) Four cases out of a household of five persons in the compounder's family at the Sudder Dispensary, Sylhet.

(b) A boy, the last of seven persons, attacked in a household of nine persons in Sylhet bazar.

(c) Everyone of the thirteen cases I saw in Shillong stated that several persons in their houses were attacked.

(5) There are numerous examples quoted by Captain D. Munro, I.M.S., in the recent outbreaks of the diseases in the Darjeeling tea Districts and Kurseong.

(6) And my friend, Major A. R. Anderson, I.M.S., brought to my notice the case of a woman who got the disease by visiting and sleeping one night in the house of some friends who had some seven cases of the disease in their house, although her house and *busti* were quite free of the disease.

On the other hand, the few cases of single infection in houses that occur can be explained by supposing that the bed bugs of these persons have not wandered to the beds of other persons.

2. It is not merely a house infection, but one showing a close association with the sleeping places of affected persons.

(a) I attach herewith a plan of the upstairs sleeping barrack in Comilla Jail. In this it is noted a curious

grouping of the cases in the sleeping ward in just such a manner as one would expect to result from the biting of a few infected bed bugs.

Note the curious manner in which the centre of the ward has been free of cases.

In this jail I had no difficulty in finding bed bugs in the sleeping ward, where the prisoners sleep on the floor.

(b) Major Leonard Rogers, R.M.S., quotes a case where three servants who slept together on a verandah of a house got the disease one after another, and from them it spread to the rest of the household.

(c) The jail at Sylhet is very much infested with bed bugs as is indeed the whole District of Sylhet (vide details in Part III under the heading Sylhet Jail—parasitic bugs, etc.).

I could not obtain, owing to the lapse of time, a floor plan of the sleeping wards in the Sylhet Jail, shewing the position of beds of infected prisoners.

A careful study of the figures shewing the distribution of the convicts in the work sheds convinced me that in Sylhet Jail (vide Part III) no form of labour and no particular work shed could be said to be more effected than another.

But 58 per cent of the cases occurred in the cubicles which are infested with bugs. Three of the wards had very few cases, while four other wards had 33 per cent of the total number of cases.

There are old wooden beds used in the sleeping wards of this jail which are very bug-infested.

(d) I have been favoured with a floor plan of the sleeping wards in the Alipore Reformatory School, at the time in outbreak of what was reported as beri beri occurred, but which is generally believed now to have been epidemic dropsy.

In this floor plan again the curious association of cases with their sleeping berths is apparent and the fewer instances in which cases occurred singly is noticeable.

3 My bug theory receives curious confirmation in Shillong.

The disease called beri beri but which I believe to be epidemic dropsy (vide Part I) is very common amongst the Khassias in and around Shillong.

I mentioned previously that I examined 13 cases at the Sadar Dispensary, and inquired from them about bed bugs.

I received the, to me, curious information that they had no bed bugs in the beds and were never bitten while sleeping in bed by bugs. A further inquiry, did they know what a bed bug was? elicited the reply that they knew very well as they see them in *morahs* (bamboo stools) they buy in the bazar. Indeed, so bug infested are the *morahs* that they have invariably to take steps to destroy the bugs in them before putting them into general use.

In my expressing surprise that new *morahs* should contain bugs so constantly, the Khassias stated that all these *morahs* were made in the adjoining Sylhet District which is known to be one of the most bug infested districts in Assam.

The prevalence of epidemic dropsy in Sylhet District and the outbreak in the jail will be remembered in this connection.

My theory then would explain the presence of epidemic dropsy in Shillong by supposing it is imported from the infected District of Sylhet by means of *morahs* and possibly other articles made in the *bustis* in Sylhet where bed bugs and epidemic dropsy both prevail.

4 Lastly, to support my bed bug infection theory, I would draw attention to the well recognised effect of evacuation of the infected jails and houses.

Take Sylhet Jail as an example—Major Hall states that the disease stopped at once when the prisoners were removed to camp, although they continued to get the same food and water as they had in the jail. My theory would explain this by the removal of the prisoners leaving their bugs behind in the wretched wooden beds used in all the wards of this jail and also in the equally favourable bamboo walls in this jail. It

may be objected that the prisoners brought their blankets and bedding with them to camp to which I would reply that the blankets and bedding were well sunned on arrival in camp and were sunned regularly during the camping out and, moreover, it is quite apparent that a tent is hardly such a bug's paradise as an old wooden bed and bamboo walls.

But why did the disease not break out on return of the prisoners to jail some two and a half months later? My answer being that meanwhile the bugs must have become decimated from starvation and the survivors got rid of the infective agent whether bacillus or protozoon from their stomach, salivary glands or elsewhere.

The same thing happened with the Alipore Reformatory School the disease disappeared when the bug infested sleeping barracks were evacuated.

Again take Comilla Jail.

When the epidemic character of the disease was recognised, Captain S. Anderson had the sleeping wards thoroughly cleaned out and overhauled and particular care was taken to clean, disinfect with antiseptic lotions and sun the blankets and bedding and issue new blankets for old and dirty ones.

This resulted in sudden stoppage of the epidemic and result brought about in my opinion by destruction of bed-bugs.

Lastly it is the recognised policy of treatment if so called beri beri or epidemic dropsy outbreaks in coolie lines in the tea gardens of Assam, especially in Sylhet, to have the infected houses evacuated and in private houses of the poorer classes evacuation is, for a few weeks at least, often voluntarily carried out in Shillong.

Another fact would also be explained by the bug infection theory, viz, that most of the cases occur after a heavy downpour of rain extending over several days. This was the case in the Sylhet and Comilla Jail outbreaks. It would be due, I think, to the inability to thoroughly sun the bedding, which, remaining in the sleeping wards, gives the bugs plenty of opportunities of propagation, and just as malaria is most common in the autumn when the mosquitoes are more numerous, so I consider epidemic dropsy cases are more numerous when bed bugs are more numerous, that is the end of the rainy season.

I know that my bug theory will be objected to on some such grounds as these (a) that bed bugs are present in almost every jail and in fact in practically every native house, and (b) that bugs are absent in a certain place where epidemic dropsy has been reported.

To the first (a) I would reply that the bed bug *per se* is not enough, this parasite is but the means of conveying a bacillus or protozoon from person to person in a manner analogous to that which obtains with the mosquito and malaria. Indeed it may be possible that only one particular variety of bug, of which I believe there are three or four kinds, convey the infection, as is the case with the mosquito and malaria, and so the disease is not so universal as bed bugs are.

To the objection (b) I would reply that I have had a fairly good experience of bug hunting and have invariably been able to find bugs in a place where they were declared to be absent.

The outcome of my theory as to the spread of the disease epidemic dropsy, is of course to suggest the remedy.

In case of an outbreak of epidemic dropsy in a jail or other institution I would recommend—

(1) the immediate evacuation of the jail for a month or two if the epidemic has assumed large proportions but I believe evacuation of the sleeping ward when the cases come will suffice if the cases are few in number.

(2) steps should be taken to destroy bed bugs in the beds, bedding, floors and wall of the sleeping wards.

But I would recommend an unremitting campaign against bed bugs in every jail in the province on the following lines—

(a) A bug gang should be established permanently in every jail consisting of intelligent convict overseers with

five or ten prisoners or even more depending on the size of the jail

The duties of this gang should be—

(1) To seek for bed bugs in the bedding and beds, and in crevices and cracks in walls and in masonry beds, and to place them when caught in small vessels containing a strong solution of carbolic acid

A note book should be kept, in which are entered the number of bugs caught by each prisoner and a reward of extra marks given the one who has accounted for most bugs at the end of each week

(2) To go round the sleeping wards and take out the bedding of the prisoners and thoroughly sun them every day

(3) To fill up all cracks in masonry with mud leaping, or mortar, and in wood or ironwood (as in cubicles) with putty which should then be painted over. All suspected crevices and cracks might first be syringed with kerosine and turpentine in equal quantities

(4) All iron beds should be frequently beaten, thoroughly sunned and washed over with the kerosine and turpentine mixture

(5) I consider the methods adopted in Mymensingh Jail should be copied in all the other jails of the Province and consist in

(1) Boiling in large boilers, specially built for the purpose, all the bedding including blankets in the jail, say, at the rate of 30 to 50 beds per diem, so as to cover the whole jail in a fortnight

The bug gang would provide the labour, and the boilers at the rate of one for each daily average of 250 prisoners would not involve much expense to Government

(2) The undertrials and new prisoners should be stripped at the entry gate, given a good soap and water bath, and passed through into the jail with new clothes provided by the jail, the undertrials receiving back their clothing next day after boiling

(3) The almost rotten old wooden beds in many of the jails of the Province should be immediately destroyed and used up as fuel. These beds are so infested with bed bugs that no other remedy is practicable. I would draw particular attention to the wooden beds in Tezpur and Sylhet Jails which I found very bug infested

I consider the prisoners would be just as well from every point of view if they sleep on the floor

(4) Government should endeavour to gradually grant money to enable the wretched uncleanly and bug infested bamboo walls in the sleeping barracks of many jails in Assam to be done away with. I would draw particular attention to these walls in the Sylhet, Gauhati and Tezpur Jails, and possibly in many other jails which I did not visit

(5) Lastly, I would make a strong appeal to the authorities to, so arrange that on the outbreak of an epidemic of unusual character orders be issued to two or even more officers of the Indian Medical Service to proceed to the affected district or jail and consult with the Civil Surgeon there as to nature, causation and method of stamping out the epidemic

In those days of specialization it cannot be expected that an officer could have an expert knowledge of every disease, and it may easily happen that an officer is confronted with a disease of which he never saw an example or with one which he fails to recognize

Had some such form of consultation been possible for years in Assam, the nature of the so called epidemic of beri beri would have been long ago recognized, and the confusion in diagnosis from other diseases having dropsy as a symptom would long ago have disappeared. The details of such consultations or conferences I will not touch upon, except to urge that it should be in the power of the Inspector General of Civil Hospitals to order a consultation when he considers the return justify it, or a Civil Surgeon should be allowed to ask for such a consultation when he desires. I was very much impressed in the course of my tour around the province by

the eagerness displayed by the Civil Surgeons and Jail Superintendents to discuss matters of professional interest and subjects bearing on their duties, and each officer in turn deplored the lack of opportunities for exchange of views in such a progressive profession as medicine, which would, I believe, if established, tend ultimately to the good of the State *

AN EPIDEMIC OF DROPSY

By T C RUTHERFOORD, M.D.,

CAPTAIN, I.M.S.,

Civil Surgeon

THE following are some observations on a small epidemic in which dropsy was the principal symptom, which occurred among the convicts in Mymensingh Jail, with special reference to the *post-mortem* appearances in two fatal cases

During November and December 1907, about a dozen convicts were admitted to the Jail hospital on account of oedema, chiefly affecting the legs and, to a less extent, the face

Attention was directed to the disease by the occurrence of the case to be afterwards referred to as No 1. All the cases with the exception of the two fatal ones were mild, and were only discovered on routine examination of the convicts at the weekly parades when all men presenting oedema were sent to hospital, isolated and subjected to a careful examination

The number of convicts in the jail at the time was about 500, including about a dozen women, none of whom were affected

In none of the cases above referred to could any symptoms of cardiac, renal or hepatic disease, malaria or kala-azar (though blood examinations were not made) be discovered, nor, with the exception of dropsy, could any of those of beri-beri. Excess of salt in the diet could be excluded with some certainty. None of them presented abnormality of the cardiac rhythm or rate (except shortly before death in the two fatal cases) absence or increase of the knee-jerk, tenderness of the calves, anaesthesia of the skin, abnormal gait, etc. Fever was not observed except in one or two of the cases though, as has been pointed out by writers on epidemic dropsy, fever may escape observation in cases of that disease. Skin eruptions were conspicuous by their absence. Gastro-intestinal symptoms were not marked and, what is of great importance in view of the peritonitis present in both fatal cases, none of the cases complained of pain or tenderness in the belly

In all except the two fatal cases, disappearance of the dropsy and recovery soon followed admission to hospital and administration of a diet of which milk, fish and *chupatties* were the principal ingredients (as contrasted with the

* [We have since learned of an outbreak of epidemic dropsy in the Dacca Lunatic Asylum, and there has been over 150 cases. This is interesting, as it shows how the present epidemic is following in its distribution the lines of the epidemics of 1878-1880.—ED., I.M.G.]

ordinary prison diet consisting chiefly of rice, pulses, and vegetables) The ding treatment consisted chiefly in the administration of calomel and saline purges

The two fatal cases will now be described

Case I—Male, Bengali Musulman Admitted into jail 1st June 1907 Health on admission good Admitted to hospital 10th November 1907, having had two previous admissions for diarrhoea

On admission patient had distinct dropsy of the legs and face No symptoms of cardiac, renal or hepatic disease or malaria or Kala azar could be detected He was put first on the diet of *chupatties*, etc., above described, and later on milk diet, particular orders being given that he should receive no salt Calomel, digitalis and quinine in pill form with sulphate of magnesium in large doses were administered In spite of this treatment the dropsy rapidly increased so that about a week after admission all the subcutaneous tissues were markedly affected An incision about 8 inches long was made over the subcutaneous surface of the left tibia in the hope that relief might be afforded by drainage through the wound A free flow of fluid occurred and continued, but no decrease in the dropsy even of the part incised, was produced The patient died on 7th December 1907 About a week before death the physical signs indicated massive effusion into the right pleura, and about the same time "œdema glottidis" and œdema of the floor of the mouth developed It was proposed to aspirate the right side of the chest, but the patient refused consent An incision about 4 inches long was made in the middle line of the neck in the hope of relieving the œdema of those parts, but none was afforded

Post mortem, 7th December 1907—The dropsy appeared to be somewhat less than before death fluid having flown freely from the wounds Rigor mortis was present

The peritoneal cavity contained a moderate quantity of serous fluid The right pleura was full of serous fluid, the left contained about two pints Neither pleura was inflamed Beneath the pleura on the lungs and diaphragm were numerous petechiæ which were also present on the œsophagus, aorta and other large structures in the posterior mediastinum

The right lung was completely collapsed and very congested, the left lung very œdemic and congested The mucosa of the trachea, especially in the neighbourhood of the bifurcation, was congested and the arytenoid epiglottic folds and epiglottis were œdemic The bronchial glands presented no abnormality The mouth and pharynx were œdematous but otherwise healthy Near the lower end of the œsophagus were four ulcers, each about $\frac{1}{2}$ inch by $\frac{1}{4}$ inch having their long axes parallel with that of the viscus Their edges were clean cut and floors free from sloughs The pericardium contained a few drams of serous fluid There were a few small patches of organising "lymph" on the outer surface of the left ventricle, whilst that of the right presented a large white patch resembling "a cardiac corn" The cardiac muscle appeared healthy The chambers of the heart were nearly empty and not dilated The aortic cusps and valves of the right side of the heart were healthy The edges of the mitral valves and chordæ tendinæ were slightly thickened (old inflammation) The arch of the aorta was healthy The larger veins throughout the body were distended with clot and bloody fluid The thyroid gland contained two small adenomata but was otherwise healthy

The parietal peritoneum appeared healthy, whilst that covering the stomach and bowels was lacking in lustre On both surfaces of the mesentery throughout its extent a thick continuous layer of organising "lymph" was present, which was in no way suggestive of tuberculous or septic peritonitis or erythritic disease The mesenteric lymphatic glands were not examined Beneath the mucous membrane of the stomach, chiefly along the greater curvature were numerous dark circular

patches, evidently hæmorrhagic, varying in diameter from $\frac{1}{4}$ to $\frac{1}{2}$ inch Scattered throughout the jejunum were areas of congestion of from 1 inch to 6 inch length which involved the whole circumference of the bowel Apart from the patches the free edges of many of the valvulæ conniventes were congested Both kidneys were congested, both cortex and medulla being involved The spleen appeared shrunken, its capsula being thrown into folds The liver, pancreas and bladder appeared normal

The veins of the diameter of the brain were congested and there were numerous "puncta cruenta" in the "centrum ovale" The ventricles contained more than the normal quantity of fluid but were not markedly distended

Case II—Male Hindu, Bengali, aged 20, admitted to jail 7th May 1907 Health on admission noted as "indifferent, anæmic," admitted to hospital 19th November 1907 complaining of general debility and malaise, it being then noted that the face was "puffy" One week previously it had been noted that the feet and legs were slightly œdemic No signs of any of the ordinarily recognised causes of œdema were detected on examination As the presence of ankylostoma duodenale had not been excluded, thymol was administered, after which it was noted that there was a trace of albumin in the urine He remained in much the same condition for a month, the œdema neither increasing nor decreasing On 19th December 1907 he, for the first time, complained of great weakness The apex beat of the heart was found in the fifth left inter space $1\frac{1}{2}$ inch external to the nipple and other signs of acute cardiac dilatation were present The heart was beating tumultuously No signs of fluid were discoverable in the chest He died at midnight, within 24 hours of the onset of acute symptoms

Post mortem, 20th December 1907—Rigor mortis was present as was slight dropsy of the face and lower limbs There was a moderate quantity of straw coloured fluid in the peritoneum The parietal peritoneum and that covering the bowel appeared normal A layer of "organising lymph" was present on both surface of the mesentery No signs of tubercle, syphilis or of sepsis in the ordinary sense were present The mesenteric glands were swollen and in some cases of a dark blue colour There was extravasation of blood and bloody serum into the tissues of the neck and also into the external coat of the aorta near the diaphragm The mouth, tongue, pharynx, tonsils and œsophagus appeared normal One of the submaxillary lymphatic glands was however slightly congested The mucous membrane of the stomach and small and large intestine was covered with a layer of very tenacious mucus, only removable by the finger under a stream of water with difficulty

In the duodenum, jejunum and upper part of the ileum were large numbers of ankylostoma duodenale There were scattered areas of congestion, involving principally the valvulæ conniventes of from 2 inches to 6 inches in length in the same regions The anterior surface of the right lobe of the liver presented two white areas about 1 inch apart each about $\frac{1}{2}$ eq inch in size due apparently to the thickening of the capsule by the formation of white fibrous tissue The cut surface of the liver was "nutmeg" in appearance Both the spleen and pancreas appeared normal Both kidneys were congested but otherwise appeared normal The thyroid gland appeared to be normal The right internal jugular vein contained ante as well as post mortem clot The large veins generally were engorged and the blood in them appeared more fluid and darker in colour than is usual after death The pericardium contained about 6 oz of straw coloured fluid There were two or three raised circular patches, on the serous surface of the left side of the parietal pericardium each about $\frac{1}{2}$ eq inch in area consisting apparently of thickened and detached serous membrane There was a similar patch about $\frac{1}{2}$ eq inch area $2\frac{1}{2}$ inches from the apex of the heart and $\frac{1}{2}$ inch to the left of the left coronary artery, with the

exception of a small effusion of blood into its outer coat and of a small patch of chronic enteritis about 1 inch above the valves, the rostrum appeared healthy. The cardiac muscle fibre adjacent to the patch was apparently healthy. On the surface of the right ventricle was a line of similar but smaller patches, running parallel with a coronary vein, about $\frac{1}{2}$ inch in length, the patches being about $\frac{1}{2}$ inch by $\frac{1}{8}$ inch in area. There were also similar patches on the lower surface of both ventricles near the septum. The heart presented no other abnormality. The larynx and trachea appeared normal, but the latter contained some blood stained frothy liquid. Both lungs were intensely congested and oedematous. The right pleura contained about one ounce and the left about 5 ounces of straw coloured fluid. The pleurae appeared to be otherwise healthy. The brain was slightly congested and its ventricles were distended with fluid, otherwise it appeared healthy.

It would seem that the above were cases of epidemic dropsy. The fact that fever and skin eruptions were not observed can hardly invalidate the diagnosis. The most striking fact with regard to the dropsy itself was that its distribution was markedly influenced by gravity, it being nearly always more pronounced on one or other side of the body so that the side on which a patient habitually lay could be predicted. The discovery of a plastic peritonitis affecting chiefly the mesentery and its record is the *raison d'être* of this paper, for since one of the cases in which it occurred presented only mild symptoms until immediately before death it is possible that the examination of the peritoneal cavity in ordinary mild cases of epidemic dropsy might yield information as to the causal organism, if any, of the disease. In this connection it is noteworthy that in neither of the fatal cases in which peritonitis was present did symptoms of that condition occur before death.

NOTE ON A PARASITE IN THE SPARROW

By I. R. ADIE,

LR COL, I.M.S.,

Civil Surgeon, Ferozepore

This is a parasite found mostly in the spleen, liver, marrow, lungs, and intestine of the common sparrow of this part of the Punjab. In the case of *Halteridium* and *Proteosoma*, the parasite is most frequently met with in the circulating blood, and less often in the internal organs, and only in the red cells when not free. In the present instance, the parasite is most commonly met with in the internal organs, not so often in the heart blood, and it is rare in peripheral blood, it is never seen in the red cells, but it is found in large and small mononuclear cells, which have an endothelial appearance, and sometimes it occurs in vast numbers apparently free. Of 24 sparrows picked up at random, no less than 18 were found infected. The parasite requires deep staining to bring it out, especially in the intracorporeal stage, when the ordinary Romanowsky stain is not strong enough, and it is necessary to use the Giemsa stain. In the free state of the parasite, staining is easier.

RECOGNITION OF THE PARASITE

If a smear of an infected spleen is made, and stained with Giemsa's stain, it might be noticed that certain mononuclear cells, small and large, have something wrong with the nucleus. These, instead of being round

or oval, are sharply notched, and consequently, an unusually large space exists between the nucleus and cell wall. This space is occupied by the parasite, which, in growing, pushes the nucleus aside. As the nucleus stains well, and the parasite badly, the gap is easily recognised and shows at once if infection is present or not (Fig 1 and others).

On further examination, the parasite is seen to consist of a round or oval body, faintly stained blue, and a nucleus of clumped chromatin in the centre. The clump of chromatin dots forming the nucleus is often the only evidence of its presence, as the protoplasm is difficult to stain (Fig 2, 3, 4, 5, etc).

Sometimes the chromatin is scattered about in rows, or curves (Fig 8). Often, more than one parasite is seen in one cell (Fig 1), and occasionally two round parasites are met with, each with a ring of minute dots (Fig 13). These rings are more easily recognised in faintly stained specimens. Less frequently, there are three or more parasites, each with its notch or niche (Figs 5, 14). In some portions of a smear, it may be found that almost every cell is infected. On further search one may come upon a cell, in which the nucleus is pushed entirely aside and flattened and reduced in size, so as to make room for a batch of daughter parasites (Figs 10, 11). In many smears only intracorporeal forms are met with. Smears of the liver and bone marrow give the same appearances, and to the same degree.

As to size, this varies from about 2μ in a newly infected corpuscle, to 10.5 and 6.5μ in one more advanced.

So much for the intracorporeal forms of the spleen, liver and marrow. Occasionally, in these same organs, parasites, apparently free in a smear, are seen in addition to intracorporeal forms—(I say, apparently free, as sections have not yet been cut). They lie dotted about, sometimes without any arrangement, sometimes in groups of about 5 or 10 or 20 or more, sometimes arranged in a circular pattern, which suggests recent escape from an envelope of some kind (Figs 17, 26). They may be present in thousands free, or in spleen cells. These are the bodies I have described in a paper "A Plea for Scirps," *I.M.G.* of July 1907. I first came upon them in the free state, in preparations stained with Romanowsky's stain. Their nature remained unknown and it was only lately, when specimen No. VI was met with and stained with Giemsa's stain, that it occurred to me that the free spores formerly seen were a phase of the parasite now found in mononuclear cells.

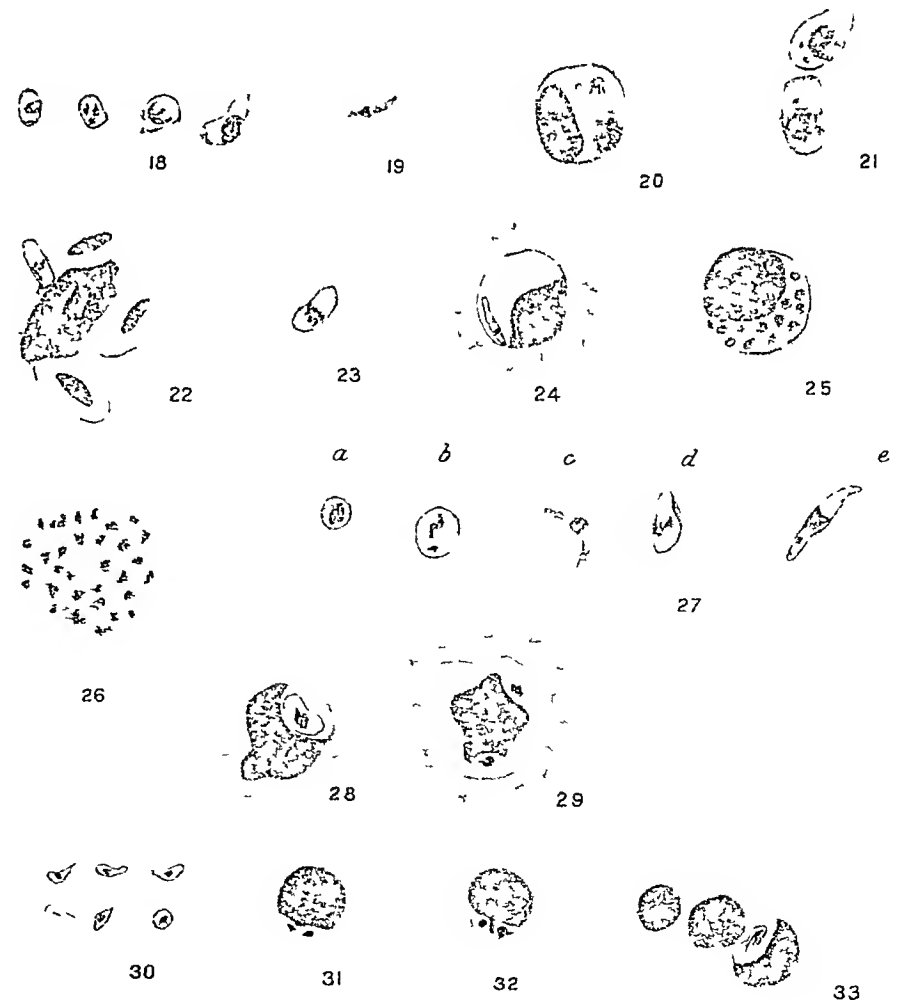
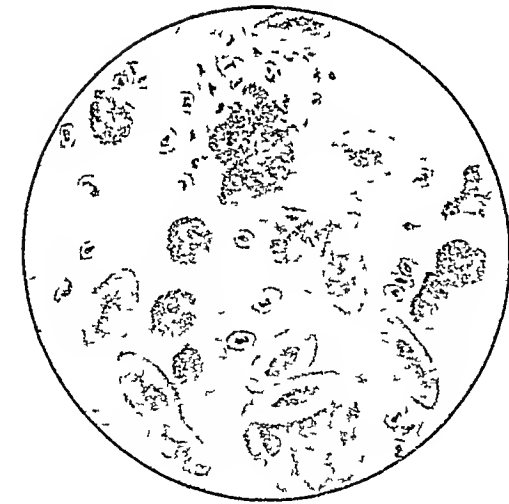
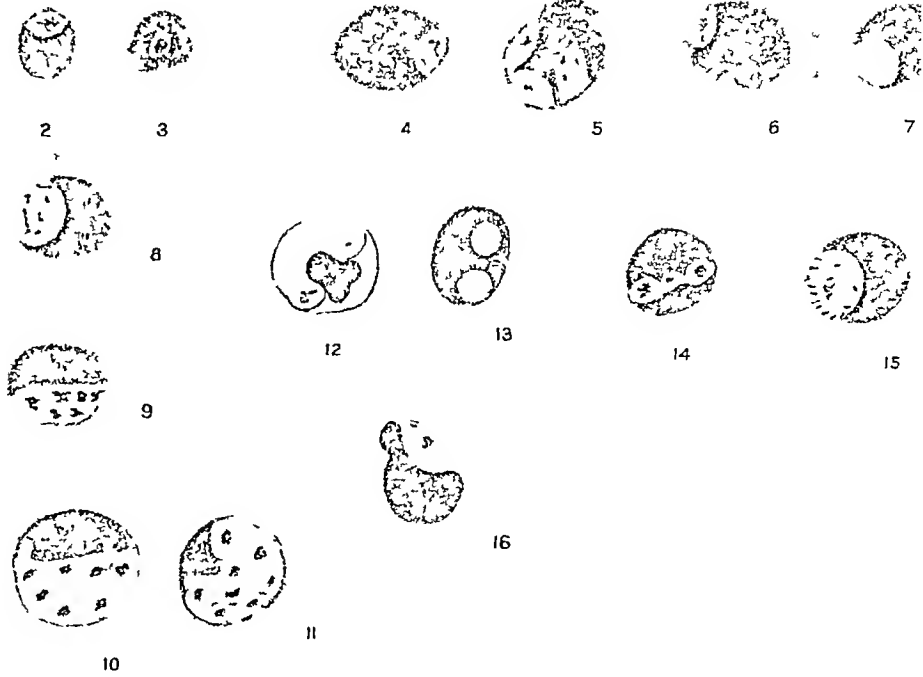
These free spores vary in size, but average about $3.5\mu \times 2.5\mu$, and stain easily, they are round or oval or pear shaped (Fig 18, 30). A lung smear affords interesting specimens. Many mononuclear cells are infected, and free forms are also seen. These are small, and round or oval (Fig 22), or may be elongated and aporozoite shaped (Fig 24). In this figure one may see an elongated form having just entered its host cell, and preparing to lie up against the nucleus. In lung and liver smears, one occasionally meets with a large mononuclear cell with two parasites, which stain differently, one having faint blue protoplasm and a diffuse red nucleus the other having deep blue protoplasm and a dark ruby compact nucleus (Fig 20, 21). This seems suggestive of male and female.

I have not come across elongated forms in the spleen, liver or marrow. In the intestine, further information was obtained. The method adopted was to pin out the gut, and open with scissors. In each of the four quarters, the contents having been cautiously pushed aside, a scalpel made a gentle scraping of the epithelium, and then smeared the scraping on a slide. This was fixed, and stained with Giemsa's stain. The following appearances were met with.

(a) Round forms, apparently free, about 3.25μ in diameter, blue protoplasm, and chromatin nucleus (either in one mass, or clumped). Fig 27, a, b.

NOTE ON A PARASITE IN THE SPARROW.

By LIEUT-COL J R ADIE, I M S, *Civil Surgeon, Ferozepore*



0 5 10 20 μ

(b) Elongated forms apparently free, sporozoite shaped, about $9\mu \times 2\mu$, plump in the middle, and tapering at the two ends, sometimes sickle shaped, nucleus well marked (Fig 27, c & e)

This sickle shaped variety (? sexual) has only been met with in the intestine and lung, not in the spleen, liver, or marrow. It would thus appear to affect situations having access to the exterior of the body.

(c) Intermediate forms, oval or egg shaped (Fig 27, d). The protoplasm in these is sometimes seen to contain minute vacuoles.

(d) Mononuclear cells containing a clearly stained parasite measuring about $5.25 \times 2\mu$ (Fig 28).

Sometimes 2 seen in a cell. These have probably just entered, and stain pretty well (Fig 29).

(e) Small mononuclear cells with faintly stained parasites just as in spleen and liver, notch well marked (Figs 31, 32, 33).

(f) In those sparrows where free spores were found in large numbers in the liver, spleen and marrow, such forms were also found in the intestine, and many specimens showed what was evidently early infection, such as a mononuclear cell with a nucleus practically entire and a dot of chromatin representing the parasite. As the parasite grows, the nucleus is pushed back, and presents the ordinary notch. One can often see, by focusing, that the notch is a hollowed out space to accommodate the oval parasite—a niche in fact. These free roundish forms are precisely the same as those found in the internal organs, and such as described by me in the paper "Plea for Scraps," *I M G*, Fig 20.

As mentioned before, the Romanowsky stain does not bring out the intracorporeal forms satisfactorily. I therefore looked up some of my old specimens of two or three years ago, which had been stained by the Romanowsky method, and re-stained them with Giemsa's stain. The result was quite satisfactory, and I commonly found parasites in smears which had been passed as normal. But even with the Giemsa stain, the organism is often represented only by a few specks of chromatin. In an ordinary way, however, even under a $\frac{1}{2}$ " obj. a positive diagnosis may be readily made by the appearance of the notched nucleus, even when the parasite is invisible.

The presence or absence of parasites, and the association of different forms, are shown in the table.

It will be noticed that there are certain points about this parasite which remind one of the Leishman Body—the size, shape and distribution, its occurrence in large cells of an endothelial character, its large numbers in internal organs, and its rarity in peripheral blood. But in no case has an undoubted micronucleus been seen.

As regards the nature of the appearances described, there seems, in the first place, no doubt that we have to do with an organism. No tissue of the sparrow or accidents of preparation and staining could produce them, although in the very early stage, an infected mononuclear cell may be taken for a perfectly normal one containing a stray speck of chromatin, but later, the notch gets bigger and bigger, and the parasite shows distinct form and better staining—all which appearances must be due to a growing parasite.

As to the life history of this organism, there is not enough information available yet to say for certain. Still, in the association of the different forms described in various organs, one can perhaps recognise several links of the chain, but there are many gaps, and the zoological status of the parasite at present is not clear. The following circumstances may be recounted—

1 This parasite does sometimes co-exist with *Halteridium* for a fair number of specimens showing the former shows ordinary sexual *Halteridium* in some degree.

2 A good number do not show *Halteridium* at all.

3 Some specimens have this parasite in large numbers yet show no *Halteridium*.

4 Specimens with very scanty parasites may show large numbers of *Halteridium*.

5 Pigment in organ smears of this parasite is not observed, while it is of course very common in *Halteridium*.

6 In smears of organs showing heavy sexual *Halteridium* infection and pigment, one might find the organism now under investigation, or one might not.

7 This organism, as before stated, is common in internal organs and rare in peripheral blood. Sexual *Halteridium* is common in peripheral blood, and almost as common in internal organs. So there might seem to be some ground for thinking that the two were phases of one life-cycle. And this would receive some support from the behaviour of the sexual and asexual forms of Malignant Tertian.

There is this difference, however, that sexual *Halteridium* and asexual and asexual Malignant Tertian are connected with the red corpuscles, whilst the parasite now being discussed is never seen in a red corpuscle.

8 *Halteridium* is very common in sparrows here, so would appear to be this organism.

9 I have never come across anything resembling a trypanosome of any stage in these preparations.

10 The spores and sporozoites (words used in descriptive sense) lying apparently loose in the internal organs and intestine belong to the same parasite as the intracorporeal bodies which produce the characteristic notching of mononuclear cells.

11 Preparations of Heart blood and internal organs showing *Halteridium*, often have large mononuclear cells containing about 8 or 9 or less spore looking objects apparently in a state of being digested ("Plea for Scraps," *I M G*). Some of the spores are represented by mere chromatin dots. I have hinted in that paper, at the possibility of these being the remains of *Halteridium* schizonts.

Such spores, it should be noted, do not notch the nucleus, in fact, they seem dead, and in process of digestion, and this would account for their diminishing size and number.

Occasionally one comes across large mononuclear cells (with natural nuclei) containing a large number of spores—12 to 20 or so.

There are many difficulties, then, in supposing this parasite to be a phase of *Halteridium*.

Laveran, to whom I have sent many specimens, has very kindly examined them, and replied to the effect that these elements resemble those he described in *Padda oryzivora*, in a note communicated to the Société de Biologie le 13th January 1900. In that note he writes "I have interpreted these elements as schizonts of *Haemaphysa Danilevski* [*Halteridium*]." It is possible it is a parasite of another species. He adds in his letter "To elucidate this question one would have to infect healthy sparrows with this parasite, and see if the birds afterwards present *Halteridium* in their blood." This is not easy for a busy practitioner to do, but it must be done, and I hope some brother officer will take it up. The difficulties are, the parasite is only, so far as I can see at present, obtainable in good numbers from internal organs, and (2) a healthy sparrow is a very uncommon animal.

One important difference between Laveran's parasite and this one is, that in the former the liver is free from spores, whereas in the latter it is heavily infected.

He also describes his parasite as free or contained in spleen cells (less so in marrow) and often attached to the nuclei of these cells. But I have not seen any illustration accompanying his paper.

Several spleen smears from rats and man have been re-examined, with a view to find something of the same appearance there, the result has been negative.

Supposing then this is a new organism, how are the various forms to be placed in the life history?

From a comparison of them all, the following appear to be likely links of the chain—

1 Infection takes place in mononuclear cells (endothelial) of the intestine and lung, the infecting forms

Examination of blood and internal organs of parrots *Starn Giemsa*

Serial number of sparrow examined	Peripheral blood	Heart blood	Spleen smear	Liver smear	Marrow smear (long bone of leg)	Lung smear	Intestine, 1st quarter	2nd quarter	3rd quarter	4th quarter	Presence of "spores" in spleen	Presence of Halteridium	REMARKS
1	ne	ne	ppp	ppp	nc	ne	ne	nc	ne	ne	—	+	Spleen has mottled surface <i>References:—</i> ne not examined p palasite present but scanty pp " " plentiful ppp " " very plentiful ss spores present scanty, &c + present—scanty, &c — absence
2	no	ne	ppp	ppp	ne	ne	ne	nc	ne	ne	—	—	
3	no	— Some leucocytes with spores	p Vely, scanty	ppp	ne	ne	ne	nc	ne	ne	—	+	
4	ne	—	—	—	ne	—	ne	nc	ne	ne	—	—	Excellent normal specimen
5	—	p Good samples	pp	pp	ppp	ne	no	nc	no	no	—	+ Vely scanty	
6	1 seen in long search		ppp	ppp (♂ & ♀)	ppp	ppp (Vely good)	?				—	—	Tapeworms Spleen slightly swollen
7	ne	p Vely scanty	ppp	ppp	ppp	ppp	ppp Free spores and "sporo zites"	pp	pp	pp Sporozoites few	—	—	Intestinal amœba
8	ne	ne	p Vely scanty & small cells	—	nc	ne	?	p 1 in long search	—	—	—	—	Amœba
9	no	Few halterid	—	Monons with digested spores	nc	—	—	—	—	—	—	+	Tapeworms Mononuclears with spores in Heart blood Amœba
10	?	?	—	—	—	1 or 2 halterid	—	—	—	—	—	+	Amœba
11	no	Monos with spores Halterid	ppp sss	ppp sss	ne	pp Halterid	Spolt	p Few sporozoites	ppp sss	pp ss Sporozoites	+++	+	Tapeworm Mononuclears enclosing partly digested spores
12	no		ppp sss	ppp sss	no	pp Sporozoites monos with spores	pp ss Sporozoites	Sporozoites	Sporozoites	—	+++	+	

	ne	+ Very scanty	ppp sss	ppp sss	ppp sss	ppp sss	ppp sss	ppp sss	ppp sss	Sporozoites	Sporozoites	Sporozoites	+	++	+	
13	ne												+			Very heavy infection, in places, almost every spleen cell infected Amoeba Large mononuclears with spores
15	ne	—	p	—	—	—	—	—	—	ne	ne	ne	+ Very scanty	—	—	—
16	ne	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17	no	ne	p Very scanty	—	—	—	—	—	—	—	—	—	+ Very scanty	—	—	—
18	ne	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19	no	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20	ne	—	—	—	—	—	—	—	—	—	—	—	+ Very scanty	—	—	—
21	ne	p 1 in long search	pp	pp	—	—	—	—	—	—	—	—	+ Very scanty	—	—	Amoeba
22	ne	—	—	—	—	—	—	—	—	—	—	—	+ Very scanty	—	—	Tapeworm
23	ne	—	pp	p	p	p	p	p	p	—	—	—	+ Very scanty	—	—	—
24	ne	ne	pp	p	p	p	p	p	p	—	—	—	1 or 2 seen	—	—	Few proteosoma Few mononuclears with spores
25	ne	no	sss	sss	ne	ne	ne	ne	ne	ne	ne	ne	+	—	—	Pigment in spleen
26	no	no	p	p	ne	ne	ne	ne	ne	ne	ne	ne	+	—	—	—
27	no	no	p	p	ne	ne	ne	ne	ne	ne	ne	ne	+	—	—	—
28	—	—	—	—	—	—	—	—	—	—	—	—	+	—	—	—
29	—	—	p	ne	ne	ne	ne	ne	ne	ne	ne	ne	+	+	+	Pigment in spleen
30	ne	ss	ppp	sss	—	—	—	—	—	—	—	—	+	+	+	Proteosoma
31	—	p	sss	p	p	p	p	p	p	—	—	—	+	+	+	Mononuclears with spores
32	Halterid	—	—	—	—	—	—	—	—	—	—	—	+	+	+	—
33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

The first 24 cases are recent dissections the last ten belong to old dissections re examined.

there being either the round or oval schizont, or the elongated sporozoite

2 The infected cells get into the circulation, and the parasites are carried to the internal organs, which is their proper home

3 Here they attack mononuclear cells, multiply in them, and produce fresh batches of schizonts

4 How the sporozoite forms come is not patent. In the internal organs, forms with different staining reaction are sometimes met with, suggesting male and female. From that to the sporozoite, however, is at present a blank.

I am indebted to H. A. Abdul Gaffar for much assistance in dissections, and staining of preparations

EXPLANATION OF FIGURES

- 1 Smear of spleen shows intracorpuseular parasites only, some cells containing one, some 2. Heavy infection of pulp cells
- 2 Spleen. Small mononuclear cell with characteristic notch and parasite
- 3 Spleen. Another view of parasite
- 4, 5, 6, 8 show various stages of development
- 5 From liver smear, shows 3 notches and 3 parasites
- 8 From heart blood—Chromatin arranged in a pattern pre-egmenting stage
- 9 Infected cell of spleen showing large number of parasites
- 10, 11 Infected cells in liver smear
- 12 Infected cell in liver
- 13 From spleen smear, 2 parasites with minute rings of dots
- 14 Three parasites from unusual point of view
- 15 Cell showing a large parasite, with coarse chromatin dots
- 16 From spleen—parasite shows central nucleus and ring of chromatin spots
- 17 Smear of liver—shows free spores, and intracorpuseular forms
- 18 Free forms in spleen smear
- 19 Free form in intestine
- 20 Cell containing 2 parasites staining differently (male and female. Liver)
- 21 Two parasites apparently just escaped from a cell (Male and female. (More highly magnified than the others). Lung smear)
- 22 Lung smear—young parasite about to enter cell
- 23 Free form in lung
- 24 Lung smear—Sporozoite shaped form just entered into a cell
- 25 A large mononuclear containing a large number of spores, from lung smear. *Halleridium* infection present
- 26 Liver smear—a group of spores
- 27 Free forms from intestinal mucous membrane
- 28 } Infected cells from intestine
- 29 }
- 30 A group of apparently free spores in intestinal mucous membrane
- 31, 32, 33 Specimens from the intestine
- 34, 35, from the same spleen smear of sparrow No. XI. There was heavy infection with new parasite, and moderate infection with *Halleridium*. Fig. 34 I take to be infection by the former and fig. 35 (nucleus not notched) I take to be a phagocyte digesting spores, probably of *Halleridium*.

A Mirror of Hospital Practice

A CASE OF CÆSAREAN SECTION AT THE CIVIL HOSPITAL, SECUNDERABAD

By C. HUDSON, D.S.O.,

CAPTAIN, I.M.S.

ON the 21st December 1907, whilst I was acting for Lieut.-Col. Thompson, M.B., I.M.S., at the Civil Hospital, Secunderabad, I got a message from the Head Hospital Assistant,

Mohamed Hussain, to say that there was a difficult labour case in hospital. The woman was a Mohamedan, aged 18. On arriving at the hospital, I was told by Miss Bayley, the Lady Superintendent, that the woman had been in labour for 7 or 8 hours, and that there had been no advance in the position of the head.

The woman had phthisis. On examination, I found the head high up in the brim of the pelvis and firmly impacted.

The uterus was contracted. I applied axis-traction forceps, but was unable to deliver, although every effort was made to do so.

Turning was impossible, due to the rigid contraction of the uterus, and to the previous escape of all liquor amnii.

Symphysiotomy did not promise sufficient room for what was evidently a large head. So having satisfied myself that the child was alive, and that the woman's condition was satisfactory, I decided on a cæsarean section in preference to craniotomy.

The woman had been at the commencement of labour put on to the table in a small room adjacent to the Maternity Ward, a room which is always used when cases are delivered. This room contains all the necessary instruments required for ordinary forceps or craniotomy cases. As the patient had been for half an hour under chloroform, whilst delivery by forceps had been tried, I decided to do the operation in the same room instead of moving the patient to the Operating Theatre.

The placenta was situated anteriorly, and there was some hæmorrhage from placental vessels on making the incision into the uterus. The incision into the uterus was quickly made, the placenta stripped off, and the child delivered alive. The uterus was swabbed out with a sponge, no blood was allowed to escape into the abdominal cavity.

The uterus was sewn up with catgut sutures, and it contracted very rapidly, all oozing stopping.

The incision through the skin, abdominal wall and peritoneum was sewn up altogether, not layer by layer.

The operation was done as quickly as possible, in about 15 minutes.

The patient left the table with a good pulse, and she was quite warm.

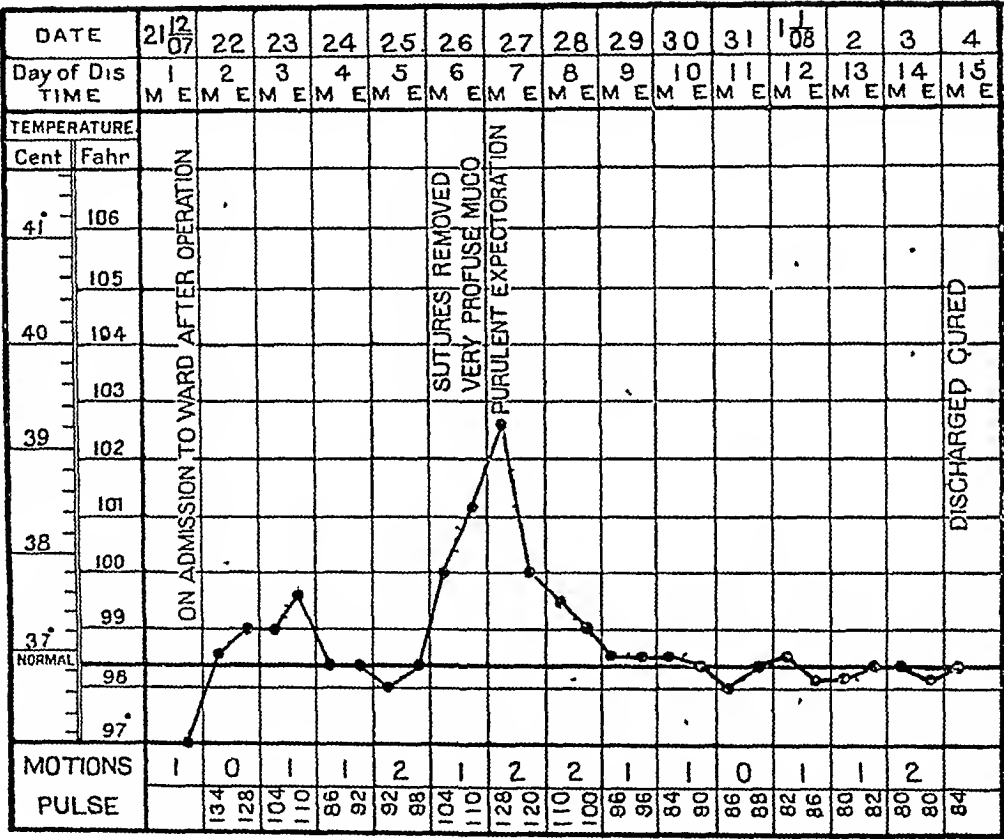
The recovery after the operation was uneventful except that on the 6th day her temperature went up to 102.8, and there was profuse phthisical expectoration of a foul smelling character.

The woman's temperature came down on the 8th day and she made an uneventful recovery.

The interesting feature of the case was the rise of temperature due, it seemed, to the accumulation and retention of tubercular sputum in the small bronchial tubes, for the temperature fell to normal as soon as the patient had freely expectorated up the foul material.

A CASE OF CÆSAREAN SECTION AT THE CIVIL HOSPITAL, SECUNDERABAD

By CAPTAIN C HUDSON, DSO, IMS



Indian Medical Gazette.

MAY, 1908

THE PROPOSED MEDICAL CONGRESS AT BOMBAY

WE have learnt with great satisfaction that it has been resolved by the medical profession in Bombay at the suggestion of H. E. the Governor, to hold another Indian Medical Congress about February 1909 in the city of Bombay.

All of us who remember the great success of the first Indian Medical Congress held in Calcutta in December 1904 will be glad to see another Congress arranged for, and we fully admit the claims of Bombay to give the second Congress a local habitation and a name. We give below an account of the proceedings of the preliminary meeting and have arranged with Lieut.-Col. Jennings, I.M.S., the Secretary of the proposed Congress, to keep our readers informed of the progress of the arrangements.

It is needless to say that the Congress must be attended by medical men from all parts of India, Burma and, we hope, of Ceylon.

Proceedings of Preliminary Meeting of Bombay Medical Congress Committee held at Government House on Wednesday, the 25th March 1908

Present at the Meeting

H. E. The Governor of Bombay (Presiding)
Col. Forman, I.M.S.
Lieut.-Col. Bamber, I.M.S. (by invitation)
Lieut.-Col. Collie, I.M.S.
Lieut. Col. Meyer, I.M.S.
Lieut.-Col. W. E. Jennings, I.M.S. (Secretary)
Maj. Winter, R.A.M.C.
Capt. Liston, I.M.S.
Sir Bhulchandra Krishna, Kt.
Dr. Cogill
Dr. Turner
Dr. Powell
Dr. Choksey

His Excellency addressed those present, thanking them for their presence, consenting to be President of the Congress, expressing a sincere hope that much valuable knowledge would be forthcoming, and promising his utmost help to insure success.

It was then formally resolved—

(1) That a Medical Congress be held in Bombay towards the end of February 1909 (exact dates to be fixed hereafter).

(2) That the residents of Bombay present at the meeting form the nucleus of a committee to be expanded by them into a Central Representative Committee comprising representatives of all the principal Medical departments or associations (official or unofficial).

(3) That besides the two Members of His Excellency's Council, the Surgeon General with the Government of Bombay, and the Principal Medical Officer, Poona Division, other representative persons, to be selected by the Central Committee, be invited to be Vice Presidents,

(4) that Lieut. Col. W. E. Jennings, I.M.S., be General Secretary and Editor of Transactions, and that all executive sub-committees and other office bearers be appointed by the Central Committees,

(5) that the Congress sit for three consecutive days from 10 A.M. to 5 P.M. (with an interval for lunch) on the first two days and from 10 A.M. to 1 P.M. on the third day;

(6) that the programme of subjects and their division into sections be drawn up by the Central Committee, special prominence being given to the following subjects,

The Etiology, Prophylaxis and Treatment of Plague
The Etiology and Prophylaxis of Enteric Fever
The Etiology and Prophylaxis of Relapsing Fever
The Differential Diagnosis of the various types of Malarial Fever, with suggestions as to means of prevention and exhibition of the results of past measures from available statistics

The part played by Parasitic Insects (other than fleas and mosquitoes) in the dissemination of diseases peculiar to the Tropics, with suggestions as to the best means of obviating the attacks of those insects

The Pathological conditions dependent upon the invasion of the Leishman Donovan body, with suggestions as to treatment and prophylaxis

The Etiology and Differential Diagnosis of the various clinical types of Dysentery. Their treatment and prophylaxis

The Treatment of Cholera

And Sanitation as applied to India,

(7) that the Central Committee decide upon the authorship of original papers, as many of those attending the Congress being at liberty to join in the debates on such papers as the limit of time for each will permit;

(8) that no original paper exceed a time limit of fifteen minutes, subsequent speeches being limited to one of seven minutes each,

(9) that exhibitions of Microscopical and Pathological specimens as well as of Diagrammatic charts and statistical Tables be arranged for, and, if possible, that, on one evening during the Session, a lantern exhibition of bacteriological and pathological slides be held,

(10) that a full programme of the Congress be widely published well before the Session,

(11) that authors of original articles be asked to send their papers to the Honorary Secretary on a date to be fixed hereafter, with short abstracts for circulation before the Congress,

(12) that it be widely notified that it will much facilitate arrangements for debate if all those intending to speak on particular subjects will intimate their intentions to the Honorary Secretary by a date also to be fixed,

(13) that all papers read at the Congress become the property of the Central Committee and be not published otherwise than in the transactions, except by special permission,

(14) that admission to the Congress be free subject to such conditions as shall be laid down by the Central Committee,

(15) that copies of the transactions be available for sale at a price to be fixed by the Central Committee, which shall not however be less than the cost of production,

(16) that the Central Committee invite pecuniary contributions from Public Bodies and Individuals to defray the costs of the Congress, *e.g.*, printing, typing, stationery, postage, travelling expenses of those invited to read original papers and of General Secretary if stationed away from Bombay or travelling on Congress duty, and other incidental expenses,

and (17) that the Honorary Secretary be authorized to incur such expenditure in connection with printing, typing, stationery, postage, advertising, etc., as becomes necessary from time to time

The Meeting then adjourned, the President requesting the General Secretary to convene a further meeting at an early date to form the Central Committee

Current Topics.

BOMBAY MEDICAL CONGRESS

THE CENTRAL COMMITTEE.

A MEETING of the Committee appointed by His Excellency the Governor to organise a Medical Congress was held at St George's Hospital on the 7th April (Colonel Forman, A.M.S., presiding) to invite representatives of different branches of the medical profession (official and unofficial) to form with them a Central Committee. There were present Lieut-Colonels Collie, Meyer and Jennings (Secretary), Major Winter, R.A.M.C., Captain Liston, I.M.S., Sir Bhattachandya Krishna and Drs Turner, Powell, Cogill and Choksey. It was resolved that the constitution of the Committee should be as follows, His Excellency the Governor of Bombay being President, *viz* —

Vice-Presidents — The two members of His Excellency's Council, The Director-General of the Indian Medical Service, The Principal Medical Officer, H.M.'s Forces in India, The Surgeon-General with the Government of Bombay, The Principal Medical Officer, H.M.'s Forces, Poona Division, The Senior Royal Navy Medical Officer in Bombay (representing the Royal Naval Medical Service), Lieut-Colonel Dinwiddie, I.M.S. (representing Medical Education), Sir Bhattachandya Krishna (representing the Bombay Medical Union), and Dr Temulji Nariman (representing Parsee medical practitioners and the Grant Medical College Society)

Members — Lieut-Colonels Collie and Meyer, and Captain Gordon Tucker (representing the Indian Medical Service and the Bombay Medical and Physical Society), Colonel Robinson and Major Winter (representing the Royal Army Medical Corps), Drs Turner and Choksey (representing the Health Department and Bombay Sanitary Association), Captain Liston (representing the Bacteriological Department), Drs Cogill and Powell (representing the Civil

Medical Department), Lieut-Colonel W. J. Buchanan, I.M.S., Editor of the *Indian Medical Gazette*, and the Editor of the *Indian Medical Record* (representing the Medical Press), Drs C. Fernandez, B. Row, and Rijabali Patel (representing private practitioners of communities), Drs Shamshudin of Baroda and Kalyanwalla of Jannagar (representing the Native State Medical Department), Rao Bahadur Kantak (representing the Assistant Surgeon class), Mr Ramchandria Iyer (representing the All India Hospital Assistants' Association), and Lieut-Colonel Jennings, I.M.S. (General Secretary).

EPIDEMIC DROPSY OR BERRI BERRI

WE have in recent issues published several papers by medical officers on the disease or diseases which have been for the past year or long more or less epidemic or at least fairly prevalent in many parts of the two Bengals and Assam. Capt S. Anderson, I.M.S., has described (*I.M.G.*, March 1908, p. 85) his cases in the Comilla Jail, Lieut F. J. Daley, I.S.M.D., other cases in the Reformatory School at Alipore, Calcutta (*I.M.G.*, February 1908, p. 53); Capt D. Munro, I.M.S., the Deputy Sanitary Commissioner, has given an account (*I.M.G.*, April, p. 124) of the cases found among the tea garden coolies in the Darjeeling District, Dr F. Pease has described (*April I.M.G.*, p. 128) the incidence of cases as seen in Calcutta and Howrah, and in the present issue we publish the valuable and complete report by Capt T. H. Delany, M.D., I.M.S., on his investigations of this disease in Eastern Bengal and Assam and another paper by Capt Rutherford, I.M.S., on cases in Mymensingh.

The question at present to be solved is, first, the nature of the disease till recently widely prevalent in the two Bengals. Is there only one disease, or two? If one disease, is it epidemic dropsy—or shall we follow Dr Pease who says that the two diseases described as epidemic dropsy and as *berri-berri* are in reality identical? It will be remembered that the disease known as epidemic dropsy prevailed very widely in the year 1877-78-79-80 in Bengal, Assam and in the Mauritius. This disease was described in the columns of the *Indian Medical Gazette* by a large number of medical men, *e.g.*, Dr O'Brien, K. Macleod, Dr Crombie, etc., and the universal impression then gained was that this disease was an entity *sur generis* and entirely distinct from, though resembling in some symptoms that still mysterious affection known as *berri-berri*. This same disease was recognised by Leonard Rogers and by Lt-Col R. Cobb, I.M.S., on its reappearance in Bengal in 1901 and 1902.

Personally from what we have seen of the cases and of the discussions about them, we are of opinion that the cases are epidemic dropsy. If we define "*berri-berri*" as a "specific form of multiple neuritis, occurring endemically or as

an epidemic," and epidemic dropsy as a "specific epidemic communicable disease characterised by the sudden appearance of anasarca, and preceded in most instances by fever, vomiting, diarrhoea or by irritation of the skin, a rash, and fever of a mild remitting type, by disorder of the bowels and by pronounced anæmia"—then we have no hesitation in saying that the disease prevalent in the Bengals in the past year certainly answers to the latter definition, which is that given by Sir P. Manson in his latest edition (p. 384).

If we are to accept the view so well urged by Dr. Pease, we must rewrite the descriptions of beriberi. It is, indeed, possible that both these diseases have been found at the same time in Malaya and the Further East, and we prefer this view which would explain the non-typical cases of supposed beriberi to the view that beriberi has been wrongly described.

We all know that what we may call the classic type of beriberi has been seen and is well known in a few parts of India and is very common in Rangoon, but we are convinced that this classic beriberi is a disease resembling but clearly differentiated from the disease which was widespread in Bengal from 1877 to 1880 and which is again prevalent in this part of India.

The discussion and the difference of opinion which exists shows the great difficulty of deciding when the essential *causa causans* is unknown. The question resembles that of the identity or difference between endemic dengue and seven-day fever, and though we believe in the essential difference between the two diseases under discussion, yet we must needs admit that the question is one on which much can be said on both sides.

DISINFECTANTS AND CHEMISTS

We have recently in good faith published certain papers and letters from firms of chemists or from the chemical experts attached to such. The result has been to inundate us with protests against doing so in one case and at the same time requests for similar concessions from the protesters!

For example, in a previous issue we published what seemed to us to be a harmless letter from a well-known firm, pointing out the many virtues of a certain well-known disinfectant much used in India. Another firm writes to us to point out that the gentlemen whose authority is quoted in the letter complained of is a paid official of the manufacturing Company. It may be so, we know not. Again, we published in good faith an article on the many virtues of another well-known preparation, and before it was long in publication we learn from a Sanitary newspaper that the author has been recently appointed as paid chemist and expert to the firm in question. All we know is that this paper seemed of interest.

Now we wish to make our position in this matter perfectly clear. We have no doubt that the great majority of the chemical disinfectants, etc., now-a-days largely heard of are very good, useful, and that they have high germicidal power. We, however, cannot possibly be judge of these matters and we are not in any way concerned as to the merits of any one of them, and we shall not lend our columns for the glorification of anyone or of all. The proper place for such is the advertisement columns and that is the place that our readers are recommended to look for such matter. We cannot lend our columns to such subjects, and we can give no opinion on the rival virtues of the many excellent disinfectants now on the market.

AN ASSAM MEDICAL SOCIETY

At a meeting of medical men held at Jorhat, Assam, on 5th December, 1907, it was agreed to form a Medical Society for Assam, and the first meeting has recently been held at Morani on 28th March. Dr. Hewan of Cinnamara was elected first President, and twenty names were enrolled as members.

Papers were read by Dr. Smythe of Sonari, on "a case of fracture of the cervical vertebrae with recovery" and by Dr. Johnston of Morani on "puerperal eclampsia". Dr. Johnston also showed some cases of beriberi. Dr. Giegorsen of Tinsukia showed some microscopical sections obtained during a recent course at the London Tropical School.

It is proposed to make the society a branch of the British Medical Association. The Secretary is Dr. Murray, Medical Officer, E. B. Railway, Landing, to whom all communications should be addressed.

THE EXPERIMENTAL PROPHYLAXIS OF SYPHILIS

THE successful inoculation of some anthropoid apes with syphilis in 1903 by MM. Metchnikoff and Roux, and the subsequent discovery by F. Schaudinn of the *Treponema Pallidum* has opened up a new era in the study of the old, old scourge of the human race.

We still await the ideal prophylaxis, an anti-syphilitic vaccine, but, meantime, considering the vital importance of the subject, especially with regard to the health of our soldiers and sailors, it is satisfactory to know that Professors Metchnikoff and Roux of the Pasteur Institute, Paris, have demonstrated that calomel ointment can prevent the onset of the disease. This simple and easy method of combating a serious disease, which, however we may deplore the fact, has always been and is very common, is surely well deserving of being thoroughly tried.

We, therefore, commend to our readers a little book entitled "Experimental Prophylaxis of Syphilis" in which this whole subject is discussed, and the work of Professors Gaucher

Metchnikoff, Roux, Paul, Salmon, Satou and Queyria is detailed *

The preventive power exerted by the ointment is not influenced by the time spent in rubbing, but by the amount of calomel in the ointment. The ordinary calomel ointment of the French Codex is useless, the formula recommended by M M Metchnikoff and Roux is as follows —

Calomel	..	33 gr
Vaseline anhydrous	..	10 gr
Lanolin	..	67 gr

The ointment should be used immediately after any danger of infection. The infected parts must be thoroughly rubbed so as to spread the ointment wherever the virus may have penetrated. Surgeons examining suspected infected cases should use the ointment before making the examination.

The whole subject is well dealt with in this little book which can be strongly recommended to all army and navy medical officers and to all surgeons.

LEISHMAN DONOVAN INFECTION AND THE BED BUG

OUR readers are aware of the work already done by Captain W S Patton, I.M.S. (Sci. Memoirs, No 27) on the development of the parasite of Kala-azar in the bed-bug. His further investigations appear in a new memoir (variously numbered 30 or 31). It is well known that Kala-azar is usually contracted by people living in close contact with others suffering from the disease and that the parasites occur in the peripheral circulation in a suitable condition for further development and are found in large numbers in the extensive ulcerations of the large intestines not uncommon in certain cases, the "terminal dysentery" recognised clinically long before the discovery of the parasite by Leishman and Donovan.

In the present memoir Captain Patton continues his studies of the intermediate stage of the development of the parasite up to the formation by the long free swimming flagellates. It will be remembered that the presence of this parasite was for long denied to exist in the peripheral blood till Major Donovan, I.M.S., demonstrated it there and that certain stages of the parasite should be found in the peripheral blood is necessary if a blood-sucking insect is the means of conveyance from one person to another.

We do not propose to follow Captain Patton in his description of his investigations, but we refer our readers to this valuable memoir.

The mechanism by which the bug sucks the blood of one patient and then can inject the virus into another person is still unknown.

It is to be noted that the bug now incriminated is called *cimex rotundatus*. The genus *cimex*

appears to contain four species, viz., (1) *C. Lectularius*, the type species, which is found all over Europe, N America, Egypt, Australia, S Africa and on the North-West frontier of India, (2) *Cimex rotundatus*, the Indian bed-bug, is darker than the former, being of a deep mahogany colour. It is found all over India, Burma, Malaya, Aden, Mauritius, etc., (3) *C. Pipistrelli* is closely allied to the Indian species, (4) *C. Columbianus* is also very similar.

A word of praise must be given to the admirable plates which adorn all this series of scientific memoirs. They are a credit to the work done by the Survey of India Department.

Two admirable pamphlets have recently come from the Bombay Bacteriological Laboratory, viz., one on the preparation and use of Anti-plague Vaccine, and another, the reprint of a popular lecture by Capt Glen Liston, the Acting Director of the Laboratory, on the cause and prevention of plague. We commend both pamphlets to the attention of Civil Surgeons, they are both most useful for the purpose of educating the public, and medical men will find them very useful for this end.

It is well known that the use of Major Henry Smith's operation for the removal of cataract in the capsule is becoming increasingly popular among Civil Surgeons in India. We also note an increased appreciation of it in various ophthalmic Journals, e.g., in the January 1908 issue of *Ophthalmology* (Vol IV, No 2, p 299) it is written—"this technique has become our choice in applicable cases. The results of the last 20 extractions of cataract in capsule were free from complications, we believe, than had the capsule laceration operation been performed, and the vision obtained more satisfactory to the patients. There is obviously real risk of escape of vitreous, but in our hands fortunately vitreous escape was not harmful and not greater than under usual methods."

The Federal Government of Australia and the Queensland Government have guaranteed an income of £700 per annum for an institute to be started in Queensland for the study of diseases of the tropics. The general management of the institution will be in the hands of the three Universities having Medical Schools, viz., Sydney, Melbourne and Adelaide.

We have received a copy of the English translation of an excellent pamphlet on Plague by Dr S K Chaudhuri, M.B., Special Health Officer, Benares. It is full of good advice and gives a clear account of the value of inoculation. It should be circulated widely in India.

* "Experimental Prophylaxis of Syphilis," by Paul Maisonneuve. Translated by F L deKerleuil, M.B. (Edin.), and Surgeon R N Bristol. J Wright & Co., 1908. Price 4s.

Reviews

Protozoa and disease comprising the sections on the causation of Small-pox, Syphilis and Cancer—By J JACKSON CLARK. Part II. Price, 7s net. Baillière, Tindall and Cox 1908.

IN 1903 the author published Part I on Protozoa and disease, which contained a useful summary of our knowledge of protozoa systematically arranged. In the present part he deals with a few non-parasitic protozoa, such as typanosoma noctuae of Schaudinn, and then gives some notes on certain tropical diseases caused by this class of parasites, including proplasmosis and kala-azar. The main bulk of the book deals with the three diseases mentioned in the title, in which the author's original work, mostly done from 12 to 15 years ago, is carefully recorded and copiously illustrated, and some recent work of other writers is added. Thus, under syphilis he describes certain intracellular amœboid like bodies he obtained in the cornea of rabbit's eyes inoculated with syphilitic virus, which he appears to think may be related to Schaudinn's spirochæte. Guarnieri's corpuscles of small-pox are described and the author's observations confirming his work is given. The chapters on cancer are mainly a repetition of the author's observations made in 1892 and the following years, and he repeats his statement that one-third of the weight of some such growths consist of protozoa. He candidly quotes the opinion of the late Dr. Kanthack and others totally disagreeing with his conclusions, but does not bring forward any conclusive new evidence on the subject. The work will be of interest to any who are pursuing investigations on these diseases, but it cannot be recommended as a full and safe guide to the present knowledge of this extremely difficult subject.

A Short Practice of Gynæcology—By HENRY J. FLETCHER, B.A., M.D., B.Ch., B.A.O. (Dublin Univ.), F.R.C.P., Gynæcologist and Obstetrical Physician to Dr. Stevens' Hospital, etc etc. Third Edition, Revised and Enlarged. Pp. xix + 518. Illustrations 310. London: I & A Churchill. 1908. Price, 12s 6d net.

THE third edition of this well-known book has been extensively revised, in parts re-written, and a large number of new illustrations added, and the work, as it now appears, will most certainly more than maintain its position as one of the best text-books on the subject in the English language.

The chapter dealing with the various displacements of the uterus, is in our opinion one of the most lucid accounts we have ever read on the subject and, being also very freely illustrated, should prove of great help to the student who is so often confused by the vague and indefinite descriptions given in many of the text-books.

The author's teaching with regard to the use of pessaries in the treatment of various displacements, that "it is unsound in principle or practice and should be confined to cases in which circumstances prevent the adoption of operative measures," represents, we think, very accurately the general trend of modern opinion.

The description given of the various forms of endometritis is well and clearly written, as far as the present somewhat unsatisfactory state of the knowledge of the pathology of this condition will allow.

In discussing the treatment of fibroid tumours of the uterus, the teaching that "there is little doubt that if it is causing such symptoms as to necessitate treatment, its removal is indicated" is in accordance with the general feeling on this subject amongst most gynæcologists, who have had much experience with these cases.

In the chapters dealing with diseases of the ovaries and tubes the importance of conservative treatment, wherever possible, is rightly insisted on, and in considering the question of the removal of the uterus together with the inflamed appendages, we think the author adopts a most scientific and sensible position in saying, "remove the uterus if its condition necessitates removal and do so quite independently of the condition of the appendages."

Except in cases of acute infection, the author, as we think quite rightly, advises the abdominal in preference to the vaginal route for the removal of the appendages, on the ground that it enables the operator to determine the conditions present with greater accuracy.

The portions dealing with the subject of gynæcological operations are very well and clearly written and amply illustrated, although we are somewhat surprised to see no reference made to the use of the Fowler position in the after-treatment of section cases, a position which is invaluable in cases where there has been an escape of septic matter in the pelvis.

In the description of the operation of Pinnorrhaphy stress is laid on the importance of suturing together the edges of the Levator Ani muscles, and there is a very good account of a modification of Lawson Tait's operation to effect this purpose.

We think we have written enough to show that the book may be most strongly recommended as a sound, accurate, up-to-date, and reliable guide for the student, and that it will also prove to be of considerable help to the practitioner, more especially in regard to treatment, as the directions given under this heading are most clear and satisfactory.

The printing of the book is in bold clear type, and the majority of the illustrations, many of which are reproduced from Kelly's Operative Gynæcology, are of a very high standard of excellence. We think both author and publishers are to be congratulated on this new edition which is sure to command a large and

ready sale amongst students and medical men in this country as well as at home

Lectures on Medical Jurisprudence and Toxicology—By FRED J SMITH, M.D., F.R.C.S. Second Edition, 1908 J and A Churchill Price 8s 6d

OF all the smaller books on Medical Jurisprudence published, we know of none which is as useful to the student and practitioner as Dr Fred J Smith's Lectures. Several years ago we very favourably reviewed the first edition and we are not surprised that a second edition has been called for. It is well known that Dr Smith is the Editor of the great standard book on the subject, Taylor's *Medical Jurisprudence*, and the fact that he was chosen to edit that splendid work is proof of his competency in the subject.

The present edition of the lecture contains three new and useful ones, *viz*, in the examination of the person alive and dead, on anaesthetics, and a valuable criticism of the "death certificate."

We consider this a most reliable book, it is clearly written in a pleasant conversational style. We know of no more useful introduction to the study of this extremely important subject.

Minor Maladies and their Treatment—By LEONARD WILLIAMS. London. Baillière, Tindall & Cox. Pp xii + 404. Crown 8vo. Price 5s net. Second Edition.

IT is only some 17 months ago that we (*I M G*, January 1907) very favourably commended to the notice of our readers this little book. Now we have a second revised and enlarged edition before us, which is a good proof that we were not alone in recognising the usefulness of this little volume. The new additions are not many, but are important, and we can heartily recommend the second edition to our readers.

A Handbook of Clinical Microscopy.—By M KESAVAR PAI, M.B., and P S RAMACHANDRIER. Bombay. Times Press, 1907.

THE object of this handbook, compiled by two Indian medical men, well known for their good scientific work, is to supply a want long felt by members of the subordinate classes of the Indian Medical Department. A wise ruling of the Bombay Medical Department insists upon these officers undergoing a postcollegiate course of instruction which includes pathology, serum reactions, insects and disease, and the rudiments of general bacteriology.

The present book is admirably adapted to fulfil this object and follows the lines of more expensive books on the same subject. It deals with bacteria and their cultivation, normal blood, staining the malaria parasite, mosquitoes, life, habits, etc., dissection of mosquitoes, serum

diagnosis, spirochaetes, filariasis, plague, fleas, rats, Leishman-Donovan bodies, tuberculosis, syphilis, mine examination, entozoa, amebæ, gonococcus, bacilli of the throat, etc.

The book is well illustrated. It is, in our opinion, well adapted for use of students in Indian Medical schools and colleges, and the two authors are to be congratulated on the production of a useful book.

Diseases of the Nose and Throat—By HERBERT TILLEY, B.S. (London), F.R.C.S. (Eng.), Surgeon to the Ear and Throat Department, University College Hospital, London, etc. London. H K Lewis, 1908. Pp xii and 539. Demy 8vo. 12s. Illustrations 14s net.

THIS is the third edition of Dr de Havilland Hall's well-known text book. Dr Tilley assisted in the production of the second edition and in this takes entire responsibility for the work. It belongs to Lewis's Practical Series and therefore debatable matters in ætiology and treatment are not gone into with detail, and few references are given. A new feature in this edition is the 'Introduction' giving certain practical points in the anatomy and physiology of the usual cavities. The first part deals with diseases of the nose, accessory sinuses and naso-pharynx, the second with diseases of the pharynx, and the third with diseases of the larynx. Formule and a good index complete the work. It is an excellent text-book, lucidly written, well illustrated and sound in practice, and it can be consulted with advantage by senior students and practitioners. It is likely to increase the reputation of the previous edition.

Diseases of the Stomach—By DR L BOAS, translated by ALBERT BERNHEIM, M.D. Five full Plates and 65 Engravings in the text. 730 Royal Octavo pages. \$5 00 and 7 00. Sold only by subscription. Publishers THE F A DAVIS Co.

THERE are three parts to this book, preliminary consideration of the anatomy, topography, physiology, and chemistry of the stomach, a general division comprising general methods of examination and treatment, and a special division devoted to the different diseases.

In the preliminary portion Pawlow's work on gastric secretion is ably abstracted, and attention is drawn to certain observations by Hirsch, which, though Boas does not say so, would appear to have a direct bearing on the origin of pyloric hypertrophy. He found that alkaline, neutral or slightly acid fluids passed readily from stomach to duodenum by relaxation of the sphincter, but that the presence of stronger solutions of acid caused contraction of the stomach and pylorus, and even tetanus of the latter, and the step from that to hypertrophy is but a short one. No special mention is made of pyloric hypertrophy. In the general division he refers chronic gastritis frequently to chronic pharyngitis as its cause, the cure

of the latter being all that is required to allow the former to cure itself. A great feature is made of tender points, chiefly dorsal, associated particularly with gastric ulcer, the author measures them by a special instrument of his own. Some stress is laid on deglutition sounds and on auscultatory percussion of the stomach, and the indications or otherwise for the use of the stomach tube, inflation of the stomach, distension of the colon with water, gastroduodenal, gastroscopy and the use of X-rays are dealt with. Chemical examination fills 140 pages, an indication of the importance the author attaches to it. It is exhaustive, and comprises the obtaining of the gastric contents, the testing of them for various substances, and the deductions to be drawn from these manipulations in the matter of motor function and absorption. He sets great store by Heller's test for blood. In this part there is an obvious misprint of myelin for mucin (p 231), it is also stated four pages further on that oxalic acid crystals in numbers have been obtained over a considerable period of time in the stomach contents. The fungus of *oidium albicans* is called sprue. A very good chapter on diet follows. The extremely slow and practically continuous administration of rectal nutriment, much on the lines which Murphy has advocated for the giving of water in peritonitis, is advised where rectal feeding is necessary. The paragraph on Wen Mitchell treatment is admirable. Balneotherapy and physical curative methods are fully taken up. Lavage is considered as rarely useful for treatment, bicarbonate of soda is given in doses of as much as 3 drachms after meals in cases of hyperacidity, and bismuth subnitrate in doses of $2\frac{1}{2}$ drachms on occasions, indeed, there is a good skiagram of the stomach obtained after giving an ounce of this salt in a pint of milk. Doubt is expressed as to whether bitters aid digestion, and it is noted that in the absence of sodium chloride from the food no hydrochloric acid is found in the gastric juice, a point which it would be well to remember in ordering a salt-free diet. The division on diseases of the stomach can be only lightly touched upon. If the pain in gastric ulcer is sufficiently severe to call frequently for a sedative, morphia is not recommended, on the ground that in some experiments its injection has increased the amount of hydrochloric acid in the gastric juice. Ergot is recommended in gastric hæmorrhage. Motor insufficiency of the stomach is classified in two grades: the first in which expulsion, though delayed, is eventually complete; second, in which it is never complete. 70 pages are devoted to this subject.

In the matter of gastro-ptosis, emphasis is laid on its close relation to ptosis of other abdominal viscera by considering all splanchnoptoses together. The author's view is that this condition as such is without symptoms, but that when complications, such as traumatism, over-

exertion, or constipation are added, it ceases to be latent. We can fully endorse his and Glenard's observation that "colospasm" is a frequent accompaniment of coloptosis, especially when coprostasis is present. The translator refers to the operation which aims at shortening the supports of the stomach, but not to operative interference directed to the correction of ptoses of other organs.

The chapter on cancer of the stomach is very good, a short reference is made to its syphilitic and tubercular lesions, and the book ends with the consideration of its motor sensory and secretory neuroses. The English is in places quaint, it would be well to explain what "noodles" taken as an article of diet are, and what precisely is meant by extract of strychnine, and by creosote in powder form, but these are minor matters, and a perusal of this review can leave no doubt as to the high estimate which we have formed of this book. It contains besides over 1,600 references to literature, mostly German, and two indices.

The Opsonic Method of Treatment.—By R W ALLEN, M.B., B.S. (Lond.) H K Lewis

THIS small book is practically the first that has appeared on this most important subject, and its chief recommendation is the avoidance of theories and the prominence given to results which have been achieved in actual practice. The essentials of technique in the preparation, standardization, etc., of the vaccines of most of the ordinary bacilli have been carefully detailed and will serve as a valuable guide to the amateur worker, who has not a large laboratory staff to aid him. The chapter on the use of Tuberculin and the conduct of cases undergoing opsonic treatment will be read with interest by all who have patients affected with tuberculosis under their care. The author brings to notice also the important fact, that the cases which most stubbornly resist treatment are those of mixed infection, and suggests the addition of the appropriate vaccine (bacillary or coccæ) to tuberculin in order to attain more satisfactory results.

The initial dose of 250,000,000 cocci in cases of acne, etc., will be regarded by workers in India as somewhat large, judging from the severity of the negative phase in published cases, but no doubt some sort of standard for tropical climates will soon be established.

The opsonic treatment of catarrh of the nasal and accessory air sinuses is new and has been the subject of the author's own research and will be eagerly read, as of the greatest clinical import.

The ophthalmic surgeon will find some indications for new treatment, especially in conjunctivitis and corneal ulcerations in certain cases.

We can heartily recommend this book to our readers.

Ophthalmia Neonatorum—With especial reference to its Causation and Prevention By SIDNEY STEPHENSON, M.B., C.M., Ophthalmic Surgeon to Queen Charlotte's Hospital, London &c London George Pulman & Sons, Ltd, 1907 Pp 258

THIS work won for its author the Middlemore Prize of the British Medical Association in 1907. It contains the most complete account there is in the English language of a preventible disease which is still responsible for a large amount of the blindness in the world. The book abounds with instructive tables taken from all available sources illustrating the prevalence, etiology, prevention and treatment of the disease. It is unnecessary to review it at any length. Every page contains facts of interest and importance. A few of general interest may be mentioned. The damage done by this form of ophthalmia in former times was appalling. Owing to a recognition of its real cause and the introduction of a rational method of prophylaxis by Ciede in 1881 the use of a two per cent solution of nitrate of silver—the disease has become much less prevalent. Even in 1889, however, it was estimated that 7,000 persons in the United Kingdom owed their blindness to it, and this number of disabled people was taken to represent an annual burden on the commonwealth of £350,000. Every blind adult probably constituting a yearly charge of £25 upon the charitable, while the State, on a low estimate, loses an equal amount. These figures are based on the blind and do not include those whose sight was diminished, not lost, by corneal opacities, etc., whose wage-earning capacity was, therefore, reduced. Fortunately, every year sees a lessening of such cases, and the publication of a work like Mr. Stephenson's must help materially to bring about such a happy result. He traces the growth of our knowledge of the etiology of the disease from Quellmalz, who in 1750 insisted on the connection between leucorrhoea in the mother and ophthalmia in the baby, next came Gibson of Manchester, who in 1807 traced the connection most clearly, and John Vetch, a British Army Surgeon, who in 1820 inoculated the methra with ophthalmic pus and thereby induced gonorrhoea within 36 hours. It was in 1879, that Neisser's discovery of the gonococcus established the proof scientifically. It is now known that, while other organisms may cause ophthalmia neonatorum, yet the gonococcus is responsible for two-thirds of all cases, and for almost every complicated instance of the ailment.

The actual infection may come about, Stephenson says, (1) in the maternal passages before the act of birth ("primitive"), (2) in the maternal passages during the act of birth ("primary"), (3) almost immediately after birth ("secondary A"), or (4) one or several days after birth ("secondary B"). The third mode of infection is the commonest. Babies born before term are found to be predisposed to the disease, their tissues are less resistant to microbic action.

As regards prophylaxis, the author regards a one per cent solution of silver nitrate as fully protective and harmless. The evidence, as far as it goes, is that protargol, argyrol and sophol solutions are also efficient, but the figures supporting this statement are nothing like so large as those proving the efficacy of the silver nitrates.

Mr. Stephenson is to be congratulated on bringing together all the known facts, many of which he originally collected himself, in such a masterly manner.

Squint and Ocular Paralysis—By E. LUCAS HUGHES, M.R.C.S (Eng.), L.R.C.P. (Lond.) London H. K. Lewis, 1907 Pp 206, illustrations 61 8vo Price, 6s 6d net

THE author has endeavoured to bring into line and compare some of the best practical teaching of the English and Foreign schools on the ocular muscles and squint. In this endeavour he has succeeded, and the book will be found a useful guide to the subject, clearing up many points of difficulty which usually confounded the student. The important work of Javal and Parnaud is fully described in a separate chapter, and the importance of the non-operative treatment of squint is emphasised in accordance with the best modern teaching. The anatomy and physiology of the extrinsic muscles and the symptomatology of paralysis of them is lucidly explained. The third section of the book deals with disturbances of muscle balance, and heterophoria and heterotropia are very clearly worked out. Altogether the work which is fully illustrated can be recommended to students of this rather difficult branch of ophthalmology.

A Manual of Prescribing—By C. R. MARSHALL London, 1908 J & A Churchill

THIS little volume by Dr. Marshall of St. Andrew's University and author of a good *Text-book of Materia Medica* is one of the best manuals for students and practitioners we have seen.

The art of prescribing is not unlikely to become a lost art, and certainly the present-day medical men are not adept at it as were the men of a generation ago. This little book of Dr. Marshall's is written from the practitioner's point of view and is well worth study by them. One very excellent feature is the Appendix on Latin, and to judge by the extraordinary lack of a knowledge of Latin Grammar as exemplified every week in the medical papers, it is very necessary for the practitioner to revive his knowledge of this branch of education. We can strongly recommend this little manual. The price is only 5s.

Aids to Surgery—By J. CUNNING Second Edition Price 4s London, 1908 Baillière, Tindall & Cox

THIS little book within the past three years has been reprinted no less than four times, which shows that its value has been recognised by students. The present edition is not a reprint but

a revised new edition, it is slightly larger, and the sections on gallstones and on the pancreas have been entirely re-written. The aim of the book is to help students for examination, after a study of a big text-book on Surgery. A volume like this will be found invaluable for a rapid review of the subject, and that it has adequately fulfilled this purpose its success shows.

Tropical Medicine—By THOMAS W JACKSON, M.D. (Lond.) Rebmán, Limited, 1907. Med. 8vo. Pp. 536, illustrations 175.

GRADUALLY as the progress of our knowledge of tropical diseases has been during the past few years, and however keen the interest now manifested in this branch of medicine, not only in medical schools but by Government departments, and mercantile communities, it is by no means every day that a new book on the subject sees the light, and it is therefore with interest that members of the medical profession will turn to this volume.

The work opens with some introductory remarks, and a brief general consideration of tropical hygiene. Here there is perhaps nothing very original to note, the author draws attention to Woodruff's suggestion that, where light-coloured outer clothing is worn in hot climates, the under-clothing should be dark in order to intercept light rays, and touches on the sterilization of water, for which he apparently considers heat the only entirely satisfactory medium. He thinks dhoby's itch is actually transmitted from the washerman by means of the clothes, in spite of the fact that many authorities make light of this danger, and has seen the incidence of the disease reduced greatly by reforms in washing. Turning to the body of the work, we find spure regarded as often merely a sequela of dysentery, and the suggestion is thrown out that the disease may be due, in these cases, to the action of toxins produced by the *Shiga* bacillus. The vexed question of the causation of beri-beri is discussed at some length, the author inclining to the view of H. Wright, that it is due to a gastro-duodenitis caused by a micro-organism which presumably enters most often by the alimentary canal, but the experience of the Japanese army before Port Arthur is also referred to, with Takaki's conclusion that the disease is due to a deficiency of nitrogenous food in association with excess of carbohydrates. Perhaps, the most interesting feature of the book is an account of the investigations in Cuba which led to the discovery of the agency of the *Stegomyia fasciata* mosquito in the spread of yellow fever, a record which is characterized with justice as standing alone for brilliancy of execution and finality of result, as evidenced by the complete eradication of yellow fever from Havana in a few short months. Space is restricted, and readers must be left to follow the account of these investigations in 'Tropical Medicine,' but it may perhaps be questioned

whether all the credit undoubtedly due in that direction has ever been accorded to Dr. Carlos Finlay, who, if we mistake not, had practically proved the conveyance of the disease by mosquitoes long before the U.S. Commission began its labours. The credit, however, of demonstrating to the world, beyond any doubt, the sequence of events, none the less belongs to the Commission, and it is needless to dilate on the result of the measures which were at once adopted for the destruction of mosquitoes.

The article on liver abscess is comprehensive, and worth reading, it comprises a summary of Cantlie's work on the subject, with some useful plates. The volume, like most medical works produced in the United States, is well printed on good paper, and the author and publishers are to be congratulated on a work which is a distinct addition to the literature of the subject.

An Essay on Disease, its Cause and Prevention—By G. E. RICHMOND, M.D. (Lond.), 1898. H. K. Lewis & Co. 2s.

THIS is an essay with the main object of showing that a large number of diseases are spread by food, or due to impurities too often found in articles of diet. The cellular theory is largely used to explain many phenomena. There are many statements made without any evidence given, e.g., "coldness of hands and feet is frequently due to bread."

The book is interesting but does not go very far.

Atlas and Epitome of Diseases of Children—By R. HECKER and J. TRUMPP. Philadelphia and London. W. B. Saunders & Co. 1907.

WE have frequently remarked on the value of this splendid series of Hand Atlas of Disease brought out by the enterprise of Messrs. W. B. Saunders & Co.

The present volume is particularly good and forms a complete illustrated volume of diseases of children. It consists of some 450 pages, and contains no less than 48 excellent lithographic coloured plates and numerous other figures in the text. It is a very useful book and can be well recommended.

The Practical Medicine Series, Vol. VIII, Materia Medica, Therapeutics, Preventive Medicine and Climatology, Series 1907. Agents Messrs. Gilhes & Co., Glasgow.

THIS is the eighth volume of a very excellent series of volumes dealing with the year's progress in medicine and surgery. The first 214 pages are devoted to a review of Materia Medica and other therapeutic agents. The next 84 pages review the year's progress in state medicine or hygiene, and the rest of the volume deals with climatology. The marked feature in this series is that papers are not too briefly synopsised, but full and complete quotations are made containing all that is of value in the articles dealt with.

The volumes are sold separately and are commended strongly to our readers

Merck's 1907 Index—New York Merck & Co, 1907

THIS annual volume is practically an Encyclopedia for the physician, druggist and pharmacist. It contains names and synonyms of all drugs, origin, nature, form, appearance, properties, solubility, effects, therapeutic uses, dosage, etc. It is a wonderful compilation and contains drugs, new and old, culled from the pharmacopœias of many countries, and the name of Merck & Co is a known guarantee of the excellence of the drugs brought out by that firm.

The Pocket Anatomy—By C H FAGGE London, 1908. Baillière, Tindall & Cox. Price 3s 6d net.

THIS is an old friend in a new face. No longer does the "Pocket Gray" exist, it is replaced by "The Pocket Anatomy," edited by Mr C H Fagge. This is the sixth edition, but the thirtieth thousand, therefore generations of medical students have found the book to be good, and it is in this sense beyond criticism. Mr Fagge has used the more modern books on Anatomy so much in compiling this new edition, *eg*, Quain's, Cunningham's and Morris' books, so that the old name of "Pocket Gray" is no longer applicable. To those of us to whom detailed anatomy is one of the "half forgotten" things, the new nomenclature is strange. Opening at p 190, for instance, we find the large intestine divided into cæcum and colon and the colon into ascending, transverse, descending, iliac and pelvic, the word sigmoid has disappeared.

The new "Pocket Anatomy" has every right to be as successful and as useful to the student as ever it was under its old designation.

Treatment of the Diseases of Children.—

By CHARLES GILMORE KERLEY, M.D., Professor of Diseases of Children, New York Polyclinic Medical School and Hospital, Attending Physician to the New York Infant Asylum, etc. Illustrations 71, pp 597. Published by W B Saunders Co, 1907, Philadelphia and London.

In the preface of this excellent work it is stated, "that it has been prepared for the general practitioner, to present to him modern methods of management, in greater detail than has been attempted in previous works on the subject. The means and methods suggested, having been drawn from experience, based upon a somewhat extensive application of the principles evolved by the author, in private and hospital practice."

We can heartily recommend this book to the notice of the general practitioner, it is not intended for students. The author has admirably succeeded in accomplishing what he set out to do. The treatment of the various diseases is given from all points of view, and every page bears testimony to the great experience and thorough judgment of the author. The articles on

nutrition and growth, infant feeding, sterilization of milk, proprietary foods, and prevention of summer diarrhœa are particularly full and interesting. The use and limitations of gavage (forced feeding) and of lavage (stomach washing) in infants is thoroughly discussed. Mention is made of the use of citrate of soda in preventing the coagulation of milk casein, of the larger doses of antitoxin which experience has shown to be advisable in cases of diphtheria (the author recommends an initial dose of 500—7,000 units), of the use of the abdominal belt to prevent vomiting in the paroxysmal cough of whooping-cough, of irrigation of the throat with hot saline solutions instead of gagging, etc. The remarks on quarantine and the precautions to be exercised by the physician when visiting cases of contagious disease are well worth the attention of all practitioners. Some exception may be taken to the statement that in one out of every five male infants circumcision is a necessity, both for his comfort and health, and the consequent advice to perform this operation as a routine measure. Also the counsel in appendicitis that pending operative procedures the bowels should be kept open by saline laxatives, will find a considerable number of opponents. From the above it will be seen that the work is eminently practical and thoroughly up to date. It is quite one of the best books on the subject which has come before us.

A History of the Christian Church since the Reformation.—By S CHEETHAM, D.D. Macmillan & Co, Ltd, London, 1907.

WE confess to having been surprised at receiving a presentation copy of this book for review, and we cannot profess to do more than introduce it to the notice of all our readers interested in the history of the Christian Church. We have read many chapters with great interest. Its impartiality and lack of one-sidedness will appeal to many. Dr Cheetham is a well-known scholar and has written a history of the early Christian Church. The book is well printed and got up.

Medical Society

MEDICAL SECTION OF THE ASIATIC SOCIETY OF BENGAL.

DISCUSSION ON EPIDEMIC DROPSY *v* BERN-BERN

Captain McKELVIE said, he had only seen a few cases at the Medical College Hospital, but he thought the two diseases were distinct. The main points of difference were the presence of rash, anæmia and fever in epidemic dropsy and their absence in bern-bern.

Captain McCay said, that he had seen distinct signs of nerve lesions in some cases of epidemic

dropsy, namely, exaggerated knee-jerks in several and loss of knee-jerks in one, so that he did not think the two could be differentiated by this symptom, and he was inclined to think there was only one disease. In ordinary forms of anæmia the salt content was abnormally high, but in two cases of epidemic dropsy he had found it to be low, only 5 to 6 per cent. The rash appeared to be of the nature of a vasomotor paralysis and a sign of involvement of the peripheral nervous system. He had found the salts in the urine slightly increased.

Dr G. C. Chatterjee had seen beriberi when house physician at the Medical College Hospital, and also much epidemic dropsy. He thought they were distinct diseases, the latter being marked by anæmia with low hæmoglobin value, while this symptom was absent in beriberi. In epidemic dropsy he had seen the hæmoglobin as low as 20 per cent and the red corpuscles only 1,200,000. Numerous nucleated red cells were also frequently found, including megaloblasts, while polychromophilia might be present. He had never seen anæmia in beriberi. Again, in epidemic dropsy the leucocytes were increased to from 8,000 to 10,000. Clinically, in beriberi tenderness in the calf and loss of knee-jerk were quite characteristic, but in epidemic dropsy there were no such definite symptoms. In epidemic dropsy the heart failure might occur, in beriberi failure of the diaphragm.

Lieut-Colonel Buchanan, R.M.S., pointed out that beriberi in Calcutta and other places affected almost solely the Chinese. Tamil coolies got the disease in Rangoon, but escaped largely in the Malay States.

Lieut-Colonel Harris, R.M.S., had carefully studied from 100 to 150 cases of beriberi in his wards, about 90 per cent of whom were Chinese carpenters from the docks, but it was very rare in Chinese shoemakers from the town. They ran the unmistakable classical course of the disease. The most prominent symptoms were loss of knee-jerk and marked tenderness of the calf muscles. In every case but one there was absolute loss of knee-jerk from the first, and in the solitary exception an increased knee-jerk was seen for only one day, being lost the next day. Further, he had never seen the knee-jerk return in beriberi, while the patients were in hospital. He had recently had in his wards three cases of epidemic dropsy from Cawnpore, where 20 cases occurred in one house, with five deaths among the women only. They showed no signs of beriberi and the knee-jerks were exaggerated in every case. Again, there was no anæmia in beriberi, while it was marked in epidemic dropsy, in which fever was also a prominent symptom, which was very rare in beriberi, and in his experience, when it occurred in that disease, the cases always ended fatally. Epidemic dropsy might end in oedema of the lungs, while in beriberi primary cardiac failure was the common cause of death.

Major L. Rogers, R.M.S., remarked that epidemic dropsy was first differentiated during the outbreaks in Calcutta and Mauritius from 1877 to 1880, and had been carefully described by Kenneth McLeod. The careful description of the disease in Captain Munro's paper and the remarks of subsequent speakers confirmed and emphasised the accuracy of the earlier accounts, and left no doubt in the mind of the speaker that the affection was totally distinct from beriberi. There were a number of diseases which presented general points of resemblance, but in which a study of the blood changes had revealed essential and absolutely distinctive differences. The frequency of anæmia in epidemic dropsy, and its absence in beriberi, had already been mentioned, but the following figures of counts he had done in eight consecutive unselected cases might be of interest in establishing this point, as they differed most characteristically from those recorded in beriberi. Thus in the latter disease it is generally agreed that anæmia is absent, and in support of this, reference may be made to the following figures (see the lower part of the table) showing the average of 17 counts by Pekelharing and Winkler and another 17 by Max Glogner. The former obtained just over 5 million red corpuscles and a colour index of 86, which would give an average of 88 per cent of hæmoglobin, a high figure for natives. The latter obtained an average of just over 4½ million red corpuscles and 90 per cent of hæmoglobin. These figures are in marked contrast with those of my cases of epidemic dropsy, in which the red corpuscles averaged just over 2½ million red corpuscles and the hæmoglobin only 37.5 per cent, giving a hæmoglobin value of 69. Again, I pointed out in the 1901 outbreak of epidemic dropsy in Calcutta that the leucocytes show a relative increase as compared with the red. This is well seen in the present table, for in spite of the anæmia, the white corpuscles averaged 8,719, or 1 white to 325 red, being double the normal proportion. In two cases a slight actual leucocytosis was present. The differential leucocyte count has not hitherto been recorded in a series of these cases as far as I know, so the figures given in the table may be of interest. They show a somewhat low proportion of polynuclears, and rather a high one of large mononuclears, which is suggestive of a protozoal organism being possibly the cause of the disease. The changes are not, however, sufficiently constant to be of diagnostic importance in separating this fever from other tropical ones. These blood changes, taken as a whole, appear to me to be conclusive evidence of epidemic dropsy being a distinct disease from beriberi.

Another outstanding point of difference is that epidemic dropsy is essentially a febrile disease, while beriberi is a non-febrile one. In the early stages of epidemic dropsy fever is practically always found in my experience.

Table of blood changes in Epidemic Dropsy and Beri-beri respectively

No	Hemoglobin	Hemoglobin value	Red corpuscles	White corpuscles	Ratio of white to red	Poly nuclears	Lymphocytes	Large mononuclears	Leucophiles
1	54	74	3,490,000	10,375	1 to 329	71.6	20.0	7.2	1.2
2	30	61	2,350,000	13,125	1 to 179	57.8	12.2	5.0	25.0
3	34	76	3,035,000	6,000	1 to 506	56.8	29.2	7.6	6.4
4	31	71	2,185,000	8,250	1 to 262	50.4	34.8	13.2	1.6
5	44	76	2,880,000	12,625	1 to 228	62.0	24.8	12.0	1.2
6	38	76	2,490,000	7,250	1 to 340	71.2	22.0	6.8	0.0
7	33	77	2,155,000	6,000	1 to 359	54.8	38.0	5.6	1.6
8	36	64	2,280,000	6,125	6 to 365	55.0	24.8	12.4	4.8
Average	37.5	69	2,608,000	8,719	1 to 325	60.3	25.2	5.6	5.9
Average of Pechelring and Winkler's 17 Beri-beri cases									
	88	86	5,100,000						
Average of Max Glogner's 17 cases									
	90	98	4,560,000						

although it may be quite slight and need the use of the thermometer to demonstrate it. It is often absent in the late stages with œdema persisting for two or more months, but in these the presence of the knee-jerk will differentiate them from chronic beri-beri, in which Colonel Harris has told us the knee-jerks are always absent in Calcutta cases as elsewhere. In severe cases of epidemic dropsy the fever may be of a high remittent type, which appears to be quite unknown in uncomplicated beri-beri. In such cases the œdema may involve the abdominal, pleural and pericardial cavities, and the latter may simulate a dilated heart. In such cases death occurs from œdema of the lungs, after prolonged dyspnoeic symptoms and not from sudden heart failure as in beri-beri. Lastly, I would lay great stress on the peculiar mottled rash on the œdematous limbs in epidemic dropsy, which is unknown in beri-beri. In its most characteristic form it appears as a purplish rufoescent network, appearing at first sight like dilated superficial veins, but proving on closer study to have a separate distribution. I have never seen it in any other disease. Thus we have to do with a febrile disease with distinct rash and constantly producing marked anæmia in epidemic dropsy with retained knee-jerk in the late stages in at least the vast majority of the cases. When a group of such cases are carefully studied, they should not be confounded with beri-beri, from which it was separated just thirty years ago.

CONCLUSION OF THE DEBATE ON EPIDEMIC DROPSY AT THE APRIL MEETING

Captain Delaney's paper on Epidemic Dropsy or Beri-beri in Eastern Bengal having been read

Dr Bentley said that the old confusion in Assam regarding the use of the term beri-beri had largely passed away. He had never seen beri-beri, or anything like it in Assam. In the Duars he had recently seen many cases of epidemic dropsy, and he was of the opinion that

any one who had seen true beri-beri and then saw epidemic dropsy could not for one moment consider them to be the same disease. The mortality among 250 cases of epidemic dropsy on a tea garden was under 2 per cent, which alone was a very strong argument against it being beri-beri.

Dr G. C. Chatterjee said that he had recently shown a typical series of cases of epidemic dropsy to Dr Strong, the Director of the Biological laboratories in the Philippine Islands, who had had a very large experience of beri-beri there. From the accounts Dr Strong had read of epidemic dropsy he was previously inclined to think it was the same disease as beri-beri, but after carefully examining these cases he had no doubt whatever that epidemic dropsy was absolutely distinct from beri-beri.

Lieut-Colonel Harris, in summing up the debate, observed that the speakers had been unanimous in regarding epidemic dropsy as practically quite a different disease to beri-beri, and he asked Dr Pease in his reply to say if he was now convinced that the two diseases were distinct.

Dr Pease, in reply, stated that he had in no way altered his opinion that the two diseases were identical, and repeated his argument that there was no one symptom by which they could be absolutely distinguished. (He, however, made no attempt to controvert the statement of several observers that anæmia and other blood changes were constant in epidemic dropsy but absent in beri-beri.)

Correspondence

CAPTAIN SUMNER'S RECENT ARTICLE

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—The interesting article by Captain Sumner, I.V.S., in your issue for February is not wanting in debatable matter, and I venture to give expression to one or two points where one may fairly, I think, join issue with him.

His main thesis is, that the human brain acts in a twofold way, has a double function. I do not quite see why the brain of the higher animals should be excluded from this consideration, but let that pass. As Captain Sumner says, only on this assumption can the difficult facts of mesmerism and the like be explained. His assumption may, therefore, be granted for the sake of argument.

According to his view, the "objective mind" is an entirely natural phenomenon, and is the expression of the normal function of a physical brain. Well and good. But when he comes to discuss the attributes of the other, the "subjective mind," he makes certain assumptions which one may perhaps be excused for believing to be radically unsound.

Captain Sumner is careful to depreciate the old unscientific attitude, when he points out that hitherto the cause of the phenomena of mesmerism has been thought to be some ill defined, supernatural sort of agency. Therefore, we might expect Captain Sumner's "subjective mind" to have a rational basis, a natural origin and function.

But what do we actually find? He goes on to show that, on the contrary, the "subjective mind" is distinctly supernatural in origin and in function. He says that we all know that we possess something that we cannot demonstrate, something that intrudes spontaneous thoughts. It follows that the subjective mind is an added thing, not related to the structure or to the functions of the brain, energizing on its own account, producing something from nothing. It is, therefore, supernatural in function, and it would appear to follow as a corollary of this that it is supernatural in origin, for unlike the other functions of the brain, it cannot have arisen in the natural course of development.

Notwithstanding the testimony of the distinguished, but unnamed, unitonist, I suggest that we are very far from at all recognizing Capt. Sumner's hypothesis as an axiom.

Having already assumed the supernatural subjective mind, Capt. Sumner necessarily has no difficulty in considering the possibility (dare one say probability) of the existence of this supernatural creation existing and energizing apart from the brain after death. As Capt. Sumner suggests the phonologists, palmists, thought readers, spiritualists, and the like would welcome such a conception. But most people, surely, would admit to an essential inability to conceive of energy existing apart from matter, and the phenomena presented by these practitioners are, we must believe, explicable on different lines.

Capt. Sumner ascribes yet another supernatural power to the subjective mind, namely, the faculty of never resting. Could this be maintained it would indeed be strong evidence in favour of his theory for no other bodily function that we know of can persist without rest, periodic or intermittent. But I confess that I fail to follow his argument. Surely, in really deep sleep, the subjective mind is not functioning? And what becomes of it when the brain is under the influence of anæsthetics?

May not one venture to maintain, Sir, the view that the subjective mind is by no means a supernatural thing, but that like the other brain functions, it is strictly physiological in its manner of working? Instead of regarding it as an additional, supernatural thing, look on it as a function arising in the ordinary course of development, not projected into the brain from without in some unknown way but a function of the senses and the brain as much as the objective mind is, not capable of independent existence and energy apart from matter, but dependent on and living with the brain, and as a necessary corollary dying with the brain.

I do not know what view the psychologists of the present day would take on this matter, but cannot help thinking that Capt. Sumner at least would not find the physiologists in accordance with him.

With apologies for taking up so much of your valuable space

Yours, etc,

RANGOON
3rd March 1908

H H E KNAPP, M.A., M.D.,
CAPT., I.M.S.

CRUDE VIEWS ON THE USE OF X RAYS

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—In the *Calcutta Medical Journal* for March last it is reported that the President of the Medical Club said "He would place little reliance on the X Rays as aids to diagnosis. He cited the case of a girl who gave history of swallowing false teeth, the X-Rays revealed their presence in the body and an operation was arranged. The missing teeth were, however, subsequently found on the bed sheet and the operation had to be given up."

There is no doubt that the use and interpretation of skiagrams requires special training and knowledge, other wise mistakes are possible, but the pronouncement from the Presidential chair of a Medical Society that little reliance could be placed on X Rays as aids to diagnosis is most astonishing.

Every surgeon and many physicians nowadays could cite cases after cases, in which by successful help of the X Rays precise diagnosis was made and lives were saved. I for one could quote dozens of such instances in my own practice.

A HOSPITAL SURGEON

CASE OF PYLOROPLASTY

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—The following case may be worth recording. Mr. Ba Sen, age 38 years, male, a Burman, was admitted with a history of progressive loss of weight and appetite, pain in the pit of his stomach and occasional vomiting for two years. For two months he vomited apparently the whole of the food eaten about two hours after every meal. The vomit at no time contained blood. He complained of constant severe pain in his stomach and was wasted to a skeleton.

On examination a soft tumour was felt in the costal angle at times, but usually this was absent. Pressure slightly aggravated the pain. Stricture of the pylorus, probably simple, was diagnosed and laparotomy performed. No tumour nor sign of ulcer was found, but the pylorus and the stomach for one inch beyond it was much thickened and very firm.

Pyloroplasty was performed, the incision extending 2½ inches. The pyloric orifice was less than a quarter of an inch in diameter and the wall about half an inch thick and fibrous. The interior of the stomach was very small but felt normal.

On return to consciousness, pain had gone and it has not reappeared. He stood 48 hours' starvation well, constantly smoking Burman cheroots. On the ninth day he took his wound open in anger at not getting more food. It was sewn up again and he has made an uneventful recovery. He remains very thin but feels well and takes all the ordinary Burmese diet.

Yours, etc,

L E GILBERT,
M.B., B.S. (LOND.),
CAPTAIN, I.M.S.

VACCINATION AND PERTUSSIS

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—On pages 343-4 of the *Indian Medical Gazette*, dated August 1906, you published a letter by Hospital Assistant Madhav Shankar, Dharrwai, on the subject of the beneficial effect of vaccination in cases of whooping cough. This communication has apparently not led to any further observations in your columns. To all who have had any experience of the disease it is well known how protracted the ailment is and how difficult is its treatment. So far as I am aware, there is no drug that acts as a specific. Mr. Madhav Shankar apparently had very good results from vaccination which he regards as a specific. He speaks of his method of treatment as an "accidental discovery," and, in the light of the observations of a number of French clinicians, it appears to me to be a subject that calls for further investigation. In the January, 1908, number of the *Medical Review of Reviews*, which has just been received, I find the following facts recorded on page 7—

"Vaccination against small pox has usually been regarded as inadvisable during the course of any infectious disease, as it is supposed to complicate the disease itself, and, in the lowered condition of the patient, may 'take' with quite unnecessary vigour. This is particularly true of scarlatina, as Jesierski has pointed out. A number of French clinicians, however, have observed that in the case of pertussis, instead of complicating the condition, vaccination seems to have a beneficial action, and in fact, may prove curative in a considerable proportion of cases. Attention was drawn to the point by Amat in a communication to the Société de Thérapeutique in April 1907, and since that time Bolognesi and Laborde have published studies on the subject which tend to corroborate this view. Bolognesi holds that if the child had been previously successfully vaccinated, a revaccination is of no therapeutic value in pertussis, but Amat and Laborde have both obtained good results, whether it was the first vaccination or not, if the vaccination were successful. Their combined experience shows that in a fairly large proportion of cases children having pertussis who are successfully vaccinated show a marked improvement within a day or so of the development of the pustule, and are completely cured in one or two weeks. The rationale of this procedure has not yet been explained."

It is interesting to note that Mr. Madhav Shankar's first observations were made in 1897-98, nearly 10 years prior to the communication made by Amat. In his first case primary vaccination caused the fits of coughing to disappear on the 5th day and in 2 or 3 days more the child was well. In his 2nd case the cure was obtained as speedily by revaccinating.

a child who had been vaccinated for the first time 2 years previously

I have had no experience with this method of treatment, but think it is worth remembering

Since writing the above, I have found in the Medical Annual Synoptical Index, 1887-98 that the beneficial effect of vaccination in cases of pertussis is referred to in the Annual for 1892, page 365, but, as I do not have a copy of the book, I am unable to refer to the observations recorded

Yours, etc.,

LAWRENCE G FINK, M.B., C.M. (EDIN.),
Civil Surgeon, Myittha, Burma

LIST OF SURGEONS IN INDIA IN 1749

By D G CRAWFORD, M.B.

Lieut Colonel, I.M.S.,
Civil Surgeon, Hughli

THE list given below of Medical Officers serving in India in 1749, is by far the oldest such list which I have ever seen or heard of, and as such may be of interest to the readers of the *Indian Medical Gazette*. Much older lists of officers of all classes serving at the Company's different Settlements in India are in existence. The oldest such list which I have ever seen referred to, for I have not myself seen the actual list, is one enumerating the Company's servants serving on the Coast

(Madras), and in the Bay (Bengal), in 1652, quoted in Yule's notes to Hodge's Diary, Vol III, p 196. This list includes two Medical Officers

At Madraspatnam, Edward Whiting, Chyrurgeon
In Pogu, Samuel Archer, Chyrurgeon

The list given below is, however, I believe, the oldest list which gives the names of all the Company's Medical Officers serving in the East. It cannot be called a list of the Indian Medical Service, for that service was not formally constituted until 1st January 1764, but to all intents and purposes, it is such a list

This list appears to have been originally compiled in the India Office in 1740 or 1750. It is now classified as "Home Series Miscellaneous, 1758". The original list has been kept up to date, by marginal notes on the left hand side, by some official in the India Office, for several years, certainly up to 1753

The names of Richard Grindall and John Zephaniah Holwell have been struck out, in the original, by drawing a pen through them. The name which once appeared before that of Andrew Munro has been so thoroughly erased that not a single letter is legible. What is the meaning of the note "Q D" opposite the names of Barlow and Munro, I do not know. Q probably stands for Quory. Possibly the actual note may be meant for Dft, i.e., defunct.

* This list was pointed out to me in the Record Department of the India Office, in 1904, by Mr S C Hill, then official in charge of the Record Office, Calcutta, now Director of Public Instruction, Central Provinces

LIST OF SURGEONS IN INDIA IN 1749

India Office, Home Series, Miscellaneous, 1758

Fort St David and Subordinates

Come home Surgeon at Fort St Geo	William Belsches Robert Turing Richard Grindall	Surgeon 2nd do per Genl Lre from St David, 22 Feby 1748 To be Assistant Surgeon at St David or Madras to succeed at first at either after Mr Munro and Stephen Lightfoot per Company's Genl Lre 22nd March 1749 N B Lightfoot died at Dacca in September 1749 Appointed to succeed Mr Belsches, per Company's Genl Lre 7th May 1746. He is not to be found in 30 registers To be employed where wanted and approved of per Company's Genl Lre 12th January 1749
Was at Bata. Come home	John Short	
Come home	John Page	
Q D	{ Nathaniel Barlow Andrew Munro (A name rubbed out, and quite illegible)	{ Surgeons at Madras Do
Fort St Geo	James Wilson at Fort St David	Do Do Deve Cotih, appointed to be employed per Company's Genl Lre 27th January 1748
	William Massey Thomas Bingley Saul Hancock Samuel Hamilton	{ Surgeon's Mate at St David in 1748
Dead	James Munro in last accounts at Devecottih	Appointed per Order Court 10th February 1747 to be employed at either of the three head Settlements if they stand in need of one per his Lre to Mr William Wood, dated 20th October 1748, writes he is entertained per Govr Council St David Surgeon at Vizagapatam To succeed to the first vacancy that shall happen after all former orders for the succession of other persons are complied with To be employed as surgeon as above
Did not go	Peter de Wendeler	
Sent to Bengal 1753	John Taylor	
Come home 1750	George Gray William Fullerton	Bengal { Surgeons To succeed per Company's Genl Lre 25th March 1748 Mate at Calcutta
Come home 1754	{ Owen Jones John Knox, Senr Christopher Irwin John Knox, Junr	{ Surgeons inhabitants of Calcutta who don't appear to have the Company's Licence
Come home Went in 1753	John Page John Taylor	Vce Fort St David To be employed as Surgeon where wanted and approved when those recommended before him have been provided for
	Gilbert Mathison Humphry Thomson Hannett John Hurdcastle William Gill John Mackenzie	Bombay { Surgeons Do Surat Do Gombroon Do Tellicherry Do Aujongo and succeeded by John Hurdcastle, per Aujongo Lre Jan'y 1750
Dead 12th Mar 1750		
	Wooton Braham Edmund Pratt Gray Benja Greenhall	Benroolen { Surgeon Mate 3rd do
Q whether at Subo Dead		St Helena { Surgeon Mate
Ordered home 1753 Gone to Benco	Samuel Falconer James Stevenson	

William Belsches served as Surgeon to the *Worcester* East Indian, and lost a leg at Canton, the Company ordered his employment at Fort St George, in a despatch dated 21st March 1739. He was sent to Fort William on 11th September 1740. From 9th February 1742 was appointed Surgeon at Fort St David, *vice* Andrew Munro, transferred in January 1747 he was appointed Agent for the sick and wounded of His Majesty's Squadron, serving in the Indian wars. In this capacity, he appears to have got into trouble over his accounts, in November and December 1749. He resigned on 12th February, 1750.

Robert Turing was appointed Surgeon's Mate at Fort St David from 27th August 1729, posted as Surgeon's Mate at Madras from 31st January 1736, appointed Surgeon at Vizagapatam 18th May 1741, transferred as Surgeon to Fort St David 17th August 1748, arrived at Fort St David and appointed second Surgeon 22nd January 1749.

What became of him subsequently I do not know. One Robert Turing received three months' salary as Surgeon on 13th May 1765. Whether this refers to the elder Robert Turing or to another Robert Turing, probably the son of the first, who was appointed to the service on 4th August 1766, is not clear. After this date all entries about Robert Turing presumably refer to the younger man, who resigned from 15th February 1783.

Richard Grindal was appointed from London as Assistant Surgeon, in a letter from Court dated 22nd March 1749. A subsequent letter, dated 28th November 1750, states that the appointment is to be considered void. In the above list his name is struck out—probably he never came out to India.

Stephen Lightfoot was appointed Surgeon's Mate at Fort St George on 12th October 1745. A letter from Court, dated 12th January 1749, orders his appointment as Surgeon. How he was transferred to Bengal I cannot say, the only subsequent information about him available is the note in this list that he died at Dacca in September 1749.

John Sheaf, or *Sheafe*, was appointed Surgeon's Mate at Fort St George on 22nd September 1743. A letter from Court dated 7th May 1745, orders the appointment of John Sheafe as Surgeon of Fort St David, on the transfer of Mr Belsches to Madras. He was buried at Madras on 10th May 1745 (Malden's List of Burials in St Mary's Cemetery at Madras, Vol I), so the note on the left of the page to the effect that he had come home, seems to be a mistake.

John Page, } I have not come across any reference
Thomas Baugley, } to any of these three men, except the
Samuel Humblon, } occurrence of their names in this list.

Nathaniel Barlow was appointed to succeed Mr Pichet as Surgeon if the latter resigned, in Madras Public Consultations of 12th May 1729. Andrew Pichet, who was appointed as Surgeon at Fort St George from 17th September 1716 died there on 6th or 7th September 1729, and presumably Barlow then took his place (Malden, Vol I).

Andrew Munro was one of the best known medical men in the early history of Madras. He was appointed Surgeon's Mate at Fort St George in September 1724. Surgeon at Fort St David, *vice* Gray, on 22nd September 1733, succeeded Robert Douglas as Surgeon at Fort St George in February 1742, when Belsches, as mentioned above, took his place at Fort St David. Madras Public Consultations of 28th December 1756 note that he had applied to retire from the service, and his appointment as Physician to the Company, apparently a minor or less honorary appointment, for Mr (James) Wilson was appointed to succeed him. On 6th June 1757 he was relieved of all hospital duties, and Mr Wilson from Trichinopoly was appointed to succeed him. He died on 25th or 26th October of the same year, and was buried at Madras on the 26th (Malden Vol II).

James Wilson was appointed, in a letter from the Court of Directors dated 27th January 1749, to go to India, and serve as Surgeon; hereafter a vacancy might exist. On 2nd November 1749 he was appointed Surgeon at Dacca. On 12th February 1750 he was appointed to succeed Belsches on the latter's retirement at Fort St David. In December 1750 and January 1751 he officiated as Chaplain, in addition to his own duties, and got an extra salary of five pagodas for the extra work. From 2nd September 1751 he was appointed Surgeon at Vizagapatam *vice* James Munro, deceased. On 12th June 1759 he was appointed third Surgeon at Madras, *vice* Hancock.

Another James Wilson was nominated as Assistant Surgeon in a despatch from Court, dated 19th December 1755, and this Wilson appears to have been the one who succeeded Munro at Madras in 1757. A despatch, dated 6th June 1757, from Fort St George to the Court of Directors, mentions Mr Wilson from Trichinopoly being appointed to succeed Andrew Munro, and also sanctions the payment of an extra allowance to Mr Wilson at Vizagapatam. This shows conclusively that there were two Surgeons of the name of Wilson then serving. One of them, I cannot say which was buried at Madras on 8th December 1761 (Malden, Vol II).

Francis William Mossey is shown as serving at Fort St David in this list, which is the earliest mention I have seen

of his name. On 10th January 1756 he was permitted to come to Madras, and reside there, on account of his health. Stephen Briggs being appointed in his place. He was buried at Madras on 24th October 1750 (Malden, Vol II).

Tyso Saul Hancock was appointed Head Surgeon at Dacca on 10th St David, Consultations of 30th April 1751, his name being spelt Hendrick. Madras Consultations of 31st October 1754 appoint him to succeed next after Mr Wilson (But, as noted above under Wilson, the latter succeeded him at Madras). He was serving at Fort St David in 1753, was appointed Surgeon at the Presidency on 3rd June 1758, permitted to remove to Bengal on 12th June 1759, and appointed Surgeon at Fort William on 21st August 1759. He resigned on account of his health on 12th November 1761, but either remained in India, or came out again for from 25th November 1770 he was reappointed a Supernumerary at Fort William, but not to iso. His name does not appear either in Dodwell and Milos' "East India Medical List" (1761-1837) or in a list of medical officers serving in Bengal in 1774 in the Calcutta Record Office. The 'Bengal Obituary' mentions his death in Calcutta, on 5th November 1775, aged 64. He is also mentioned as a personal friend in some of the letters of Warren Hastings.

James Munro was appointed, along with Lightfoot, in a despatch from Court, dated 12th January 1749, and was appointed Surgeon at Vizagapatam from 22nd February of that year. He died there on 31st July 1751.

Peter de Wendeler was appointed, in a despatch from Court dated 28th November 1750 to go to India and succeed to the first vacancy as a Surgeon at any of the Company's settlements. Apparently he never joined.

John Taylor is shown in this list as serving in Madras in 1749. He was transferred to Bengal in 1753, and took the place of Owen Jones as Assistant Surgeon from 4th January 1754. He was in Calcutta at the siege and capture of Fort William in 1756, and was taken prisoner but escaped the Black Hole. He escaped, or was released, and joined the other refugees at Fulta. In 1769-70 his name appears as one of the medical officers who received a share of the profits of the Private Trade Association. He resigned, as Head Surgeon, on 12th February 1771.

George Gray served as Surgeon at Fort St David from 10th April 1732 to 14th September 1733, when he resigned, and went on to Calcutta. There his name appears in the Parish Register, as having married Miss Isabella Grayham (Graham?) on 21st January 1734. A letter from Bengal, dated 18th September 1752, mentions him as Hospital Surgeon at Calcutta, and another letter, dated 7th December 1754, calls him Senior Surgeon. He also was taken prisoner at the capture of Calcutta in 1756, but was not in the Black Hole. He resigned on 3rd March 1760, and died at Huntingdon, in Scotland, on 26th March 1781.

John Zephaniah Holwell came out to India as Surgeon to an Indian in 1732, and remained there as a medical officer, but did not come on the regular establishment of medical officers till March 1742. He went home in 1748, which is presumably the reason why his name is struck out in this list of 1749. In 1752 he came out again as twelfth in Council and Zemindar of Calcutta. When Siraj al Daula attacked Calcutta, and captured Fort William in 1756, after the desertion of the Governor, Drake, Holwell, though not the senior officer remaining at his post, was chosen to conduct the defence. He was one of the 23 survivors of the Black Hole, and after wards served for a short time as Governor of Bengal, in succession to Clive, from 28th January 1760 to 27th July 1760, when he resigned, and returned to England for good. He died at Pinner near Harrow, on 5th November 1778.

William Fullerton plays a more prominent part in history than any of his medical contemporaries, except Holwell. He was appointed one of the Surgeons to the Calcutta General Hospital, succeeding Holwell, in 1744. "The President proposed and ordered the appointment of Mr John Knox, but the majority did not approve of the appointment." (Letter from Bengal, dated 23rd August 1750, paras 30 and 61). He was in Calcutta at the time of its siege and capture, in 1756, but appears to have been on board one of the ships, on professional duty, at the time of the Governor's flight. On 8th December 1757 he was appointed Mayor of Calcutta for the ensuing year. In a letter, dated 1st September 1760, he resigned his Surgeonery at Calcutta, after which he was appointed Surgeon to the Patna Agency. He greatly distinguished himself during the war in Behar, both in the action at Masimpur, on 9th February 1760, and in the subsequent siege of Patna (Broome History of the Bengal Army, Vol I, pp 281-293 and p 297, these services are also mentioned in the 'Sel-i-Mutaghori,' translation

* In an article entitled "Preservice Surgeons," published in the *Indian Medical Gazette* of January and February 1902, I gave a sketch, at some length, of the careers of Holwell and Fullerton, with shorter notices of Gray, Taylor, Knox, and Jones. In this article Broome's account of Fullerton's gallantry at Masimpur and at Patna is quoted at full length.

Vol III, pp 340 and 350) Fullerton was taken prisoner, with the other English Officers there when Patna was captured by Nawab Kásim Ali in 1763, and was the only man spared, when all the rest perished in the Patna massacre (Broome, p 302, also Sen i Mutqáherin Vol II, p 506) Subsequently he fell into bad odour with the Government. Two letters from Bengal, dated 16th January 1761, paragraphs 6-8 and 30th October 1762, paragraphs 85-93, speak of him unfavourably. "Mr Fullerton, formerly Surgeon, has been of late Nandkoomar's associate. He has always been at the head of a party, and has now taken his passage home in the *Latham*. He is suspected of encouraging the correspondence to promote the disaffection of the Burdwan Rajah. Mr Fullerton is a great brane to Society, and the Company's Service so much is said of him that he may not on any account be suffered to return." In spite of having taken his passage in the *Latham*, he remained in India at least up to March 1766. The actual charge against him appears to have been as follows—Nandkumar wrote to Raja Bulwant Singh, advising him against an alliance with the English. General Clive wished Nandkumar to be removed from the Nawab's service. Fullerton acted as interpreter at an enquiry held into Nandkumar's conduct. Knew of this letter and did not mention it. He appears to have been censured only, for a letter from him is extant in the Calcutta Record Office, dated 21st March 1766, in which he answers the censure passed on him in the Consultations of 24th February 1766. This is the last definitely dated mention of Fullerton which I know of. He appears to have been on terms of intimate personal friendship with Syed Ghulam Husain Khan, the author of the "Sen i Mutqáherin," who constantly refers to their friendship in the second volume. In Vol II, p 7, he mentions Fullerton for the last time. "He* had been heretofore a warm friend of Doctor Fullerton's, but having become his sworn enemy, he had put some matters into Lord Clive's mind, that made him dismiss the Doctor from the service. This gentleman, after taking an affectionate leave of his friends, by whom he was exceedingly regretted, set out for his country from which he promised to come back again, on his being able to obtain certain conditions and stipulations for himself. It appears that his intention did not tally with the decrees of Providence, for he has not yet appeared, although there is intelligence of his being alive and in health. Whatever he may be, God Almighty preserve him in peace of mind."

Owen Jones, Surgeon's mate, was permitted to return to England on 4th January 1754, when John Taylor, from Madras, took his place in Calcutta.

John Knox senior, had a long and somewhat stormy career in India, partly as a Surgeon, but more as a free adventurer. A letter from Bengal, dated 8th December 1853, paragraph 113, mentions his being continued in the Hospital on the return of Mr Inglis, and recommends him as having been thirty years in the service. This would put his first appointment about 1725. In spite of his long service, he appears never to have got upon the regular establishment of Surgeons. We have seen how he was a candidate for the appointment of Surgeon when Fullerton was chosen in 1744. He was appointed Assistant Surgeon, in place of Inglis gone home on 11th March 1754, and kept on as a supernumerary when Inglis returned in 1755. He must have left Calcutta soon after, as he is heard of in December 1755 at Tellicherry, disputing on trade matters with the Calicut merchants who among other things, refused some opium with which he had supplied them, rejecting it as bad. Or possibly this Dr Knox may have been John Knox, junior. He was in Calcutta at the time of the siege and capture in 1756 and remained there till the final surrender, after which he escaped. He died in Calcutta soon after, being buried there on 6th January 1758. He appears to have been also known as Pahlra or Patna Knox, having accompanied the annual Patna party on several occasions, and perhaps having served there as Surgeon.

John Knox, junior, was also a Surgeon, but was making his living as a free merchant at the time of the capture of Calcutta, in 1756. He also remained in the fort up to the surrender and afterwards escaped. The *Calcutta Gazette* of 19th October 1815 mentions the death of his wife. "On the 10th current, Mrs Knox, aged 74. She is the last of those who survived the horrid scene of the Black Hole in 1756. She was at that time fourteen years of age, and the wife of a Dr Knox. The day before she died, she went out to take an airing in her palanquin, and preserved her faculties entire to the last." This lady must have been the wife of Dr John Knox, junior, for John Knox senior and his wife Elizabeth had a child, Elizabeth christened on 14th October 1749. Both the Elizabeth Knoxes, mother and daughter, were in Calcutta at the time of the siege, and were among the refugees at Futta. It is well known that only one woman, Mrs Carey, was in the Black Hole so the statement that Mrs Knox was one of the survivors is incorrect.

Christopher Burn. I know nothing about. He was not in Calcutta in 1756.

Gilbert Mathiason was appointed Surgeon at Tellicherry from 31st January 1744, and at Surat from 31st March of the same year. His death is reported in a letter from Bombay, dated 8th April 1768.

Humphrey Thompson was appointed Surgeon at Bombay in February 1747. His death is mentioned in the Bombay Consultations of 12th August 1757.

Robert Harriot was appointed Surgeon, in Bombay Consultations of 7th April 1747. The same Consultations, on 25th March 1760, note that he is permitted to return home, on sick certificate.

John Hurdcastle was entertained as Surgeon at Gombroon, the modern Bandar Abbas, in Bombay Consultations of 20th April 1747. He became Surgeon at Aujengo in 1750 and was transferred from Fort Victoria to Surat on 30th August 1757.

William Gill, Surgeon at Tellicherry, was still serving there in 1763 and 1766.

John MacKenzie, Surgeon at Aujengo, died there on 12th May 1750.

Woolton Braham. A Surgeon of the name of Braham is mentioned in a letter, dated 6th February 1760, from the Court of Directors to Madras.

Gray. This officer, stationed at Bencoolen in 1749, cannot be the same as George Gray of Bengal. A Mr Gray is mentioned in Fort St George Military Consultations of 25th October 1759, as Surgeon at the camp, and is ordered to be reimbursed the value of his instruments, lost in the repulse of an attack by the English upon the pettah of Wandiwash.

Edmund Pratt
Benjamin Greenhall
Samuel Falconer
James Stenenson

I know nothing of these officers, except the occurrence of their names in this list.

Service Notes

With very much regret to have to record the death, on 9th April, of Lieutenant Colonel F S Peck, I M S, Professor of Midwifery at the Calcutta Medical College, and Obstetric Physician to the Eden Hospital. Lieutenant Colonel Peck was born in 1835, took his M R C S in 1879, entered the service in October 1880, was promoted Lieutenant-Colonel twenty years after and was put on the selected list on 10th October 1906. He would have completed his 30 years' full pension service by 3th December 1910.

Lieutenant Colonel Peck served for many years as a Civil Surgeon in Bengal, and was for long Civil Surgeon of Muzafferpur, where he was extremely popular. He was a very keen volunteer and a member of the Behar and the Calcutta Light Horse, he was also an enthusiastic polo, tennis and golf player and a sportsman in the best sense of the word.

As a Civil Surgeon, he earned a good reputation especially as an operator, and was specially chosen to succeed Lieutenant-Colonel Joubert, I M S, in the Medical College, on the retirement of the latter. He was a brilliant operator and a skilled gynaecologist, and he had established a large private practice in Calcutta.

Socially, he was liked by a large number of people, and he always entertained most hospitably. In July last Lieutenant Colonel Peck met with a serious railway accident on the line near the Sheringham Golf Links in Norfolk, and has never been the same man since. It is easy now to say that he should never have come out to India again, but he thought he would be able to continue his work. During the cold weather however he became increasingly unfit for the hard work of his appointment, and he started for home on 28th March and died on board ship on 9th April 1908, and in his death the service has lost an able surgeon and a genial personality, who will long be remembered by his friends and by those who worked with him and under him.

THE retirement from the service is gazetted, from the 20th March 1908, of Lieutenant Colonel Sir Richard Havelock Charles, K C S I, Professor of Surgery in the Medical College Calcutta and Surgeon to the Medical College Hospital. Sir Richard Charles was born on the 10th March 1858, studied at Queen's College, Belfast, and University College London took the degrees of M D with honours M C H and L M in the Royal University, Ireland, in 1881, and entered the Bengal Medical Service, passing first on 1st April 1882. He became Surgeon Major on 1st April 1894, and Lieutenant Colonel on 1st April 1902. He took the diploma of F R C S I in 1891, and was made F R C S, England, *honoris causa*, in 1906.

* General Clive.

† Madras Press List, Tellicherry Proceedings of 1755.

During his brief career in the Military Department, he was officiating in the 11th Bengal Lancers, when that regiment was selected to furnish the escort to the Afghan Boundary Commission, under Sir Peter Lumsden, in 1884, and was appointed Medical Officer of the escort. On his return he was nominated to the Chair of Comparative Anatomy in the Lahore Medical College, from 5th May 1886, and also Second Surgeon to the Mayo Hospital, Lahore. In 1891, the title of the chair was changed to Anatomy, and from 20th April 1894 when Colonel Rye was promoted to the administrative grade and Lieutenant Colonel O'Brien succeeded him as Professor of Surgery in Calcutta, Surgeon Major Charles took the place of the latter as Professor of Anatomy. This appointment he held until 30th March 1905, when he became Professor of Surgery, on the promotion of Colonel R. D. Murray. It is not often that a medical officer puts in a quarter of a century's service with so few changes of appointment.

When H. R. H. the Prince of Wales along with the Princess, came to India in October 1905 Lieutenant Colonel Charles was selected for the appointment of Medical Officer in their suite. At the end of their tour he was made a Knight Commander of the Royal Victorian Order, and later in 1906 was appointed Physician in Ordinary to the Prince of Wales. He accompanied the Prince home in March 1906, and has since been on furlough, practising in London.

Sir Richard Charles is the author of several papers on his first subject, Anatomy, viz., "Remarks on the Morphology of the lumbar, sacral, and caudal regions of the Panjabi," "the Influence of Function as exemplified in the Morphology of the lower extremity of the Panjabi," and "on the Identification of European and Oriental Skeletons." He also wrote a "Report of the Hospital Service connected with the escort which accompanied the Afghan Boundary Commission," and contributed to our own columns an important paper on "the Treatment of Elephantiasis of the generative organs."

Now that Sir Richard Charles has retired, there is no officer left on the active list of the Indian Medical Service who holds any Order of Knighthood. There are no less than twelve however on the retired list, as follows—

- (1) Sir Henry Jules Blane (Bombay), K.C.V.O., 23rd July 1901
- (2) Sir Richard Havelock Charles (Bengal), K.C.V.O., 19th March 1906
- (3) Sir Calvin Colvin Smith (Madras), K.C.B., 26th June 1903
- (4) Sir Annesley Charles Custiot De Renzy (Bengal), K.C.B., 26th June 1902
- (5) Sir Benjamin Franklin (Bengal), K.C.I.F., 1st January 1903
- (6) Sir William Ree Hooper (Bengal), K.C.S.I., 1st January 1903
- (7) Sir George King (Bengal), K.C.I.F., 1st January 1898
- (8) Sir John James Trevor Lawrence (Bengal), K.C.V.O., 9th November 1902
- (9) Sir Alfred Swaine Lethbridge (Bengal), K.C.S.I., 20th May 1897
- (10) Sir George Scott Robertson (Bengal), K.C.S.I., 17th July 1895
- (11) Sir Benjamin Simpson (Bengal), K.C.I.F., 15th January 1897
- (12) Sir James Howard Thouton (Bengal), K.C.B., 24th June 1904

In addition, Sir John James Trevor Lawrence and Sir Alexander Christison hold inherited baronetcies.

The following Majors are promoted to be Lieutenant Colonels, with effect from 31st March 1908—

- James Reid Roberts M.B. F.R.C.S.
- James Graham Hojel M.B.
- Frederick William Gee M.B.
- Kanta Prasad M.B.
- Patrick Wilkins O Gorman
- William Henry Gray
- Henry Charles Leffler Ainslie
- George Storne Thomson, M.B.
- Frank Charles Pereira, M.B.

"The services of Colonel J. McCloghly, F.R.C.S.I., I.M.S. (Bombay), are placed temporarily at the disposal of the Government of Bombay."

This means that Colonel McCloghly is to be next Surgeon General with the Government of Bombay, to succeed Surgeon General Green. Colonel McCloghly was educated in Dublin and took the F.R.C.S. of the Irish College in 1886. He entered the Bombay Medical College at end of March 1875, was promoted to be Colonel in June 1905 and now at the age of 56 becomes Surgeon General, Bombay Presidency. He has been in Civil employ in Bombay Presidency and was for a long time Civil Surgeon of Karachi. Recently he has been P.M.O., Sialkot and Abbottabad Brigades.

The following officers of the Indian Medical Service, having satisfactorily completed their courses at the Royal Army Medical College, and at Aldershot, have been finally admitted to the service. Their commissions will bear date the 27th July 1907—

- Hugh William Acton
- Vivian Bartley Green Airmytago
- Arthur Norman Dickson, M.B.
- Alexander Glover Conlie, M.B.
- Alexander James Hutcheson Russell, M.B.
- Robert Ernest Wright, M.B.
- Dewan Hakumat Rai, M.B.
- William Hunter Riddell, M.B.
- Arthur Bateman Zeiah, M.B.
- Arnold Theinms Densham
- Frederic Allan Baker
- Arthur Waltham Howlett, M.B.
- Arnold Newall Thomas
- Francis Shingleton Smith

LIEUTENANT COLONEL G. W. P. Denny, I.M.S. (Bengal), an Agency Surgeon of the 1st class, is appointed to officiate as Agency Surgeon and Administrative Medical Officer in the North West Frontier Province, with effect from the 1st March 1908, and until further orders, *vice* Colonel A. M. Crofts, C.I.F., I.M.S., promoted.

CAPTAIN D. STEEL, I.M.S., is granted leave in and out of India on medical certificate, with effect from 6th September to 31st October 1908.

The services of Captain H. A. Williams, D.S.O., M.B., I.M.S., have been permanently placed at the disposal of the Burma Government.

CAPTAIN T. F. OWENS, I.M.S., is appointed a probationer in the Chemical Examiner's Department and is posted to Calcutta.

MAJOR A. R. S. ANDERSON, I.M.S., Civil Surgeon, Rajshahi, is granted combined leave for eighteen months, *viz.*, privilege leave for three months and furlough for the remaining period, under Articles 260 and 303(b) of the Civil Service Regulations, with effect from the 10th April, or any subsequent date on which he may avail himself of it.

MAJOR D. Green, I.M.S., Civil Surgeon, Shillong, is appointed Civil Surgeon, Rajshahi.

MAJOR J. JACKSON, I.M.S., Superintendent of the Yerarda Central Prison has been allowed by the Secretary of State for India an extension for five months of the furlough granted to him in Government Notification No. 1398, dated the 6th March 1907.

On return from the leave granted to him in Notification No. 10548, dated the 19th of July 1906 Lieutenant Colonel W. R. Clark, I.M.S., reported his arrival at Bombay on the afternoon of the 6th of March 1908, and was appointed Civil Surgeon of Rawalpindi, with effect from the afternoon of the 12th idem, *vice* Lieutenant Colonel H. Hendley, I.M.S., proceeding on leave.

MAJOR E. S. PECK, I.M.S., Civil Surgeon, Guadapur, has obtained privilege leave of absence for three months with furlough on medical certificate for 15 months in continuation thereof, under Articles 260, 233 and 303(a) of the Civil Service Regulations, with effect from the 23rd of March 1908, or the subsequent date from which he may avail himself of it.

CAPTAIN E. F. G. TUCKER, M.R.C.P., J.R.C.P., I.M.S., to act as Presidency Surgeon, Second District, and Marine Surgeon, and Superintendent, Lunatic Asylum, Colaba, *vice* Major J. H. McDonald, M.B., C.M., I.M.S., proceeding on leave, pending further orders.

SURGEON GENERAL BENSON'S date of appointment as Surgeon General with the Govt. of Madras is dated 31st March 1908.

The services of Lieutenant Colonel C. Monk, I.M.S. (Bombay), are replaced temporarily at the disposal of His Excellency the Commander in Chief in India.

LIEUTENANT COLONEL A. T. BOWN, I.M.S. (Bengal), is placed on special duty under the orders of the Director General, Indian Medical Service.

The services of Captain T. H. Delany, M.D., I.M.S., are replaced at the disposal of the Government of Bengal, and he has been posted to Arrah as Civil Surgeon.

LIEUTENANT COLONEL C R M Green, M.D., F.R.C.S., I.M.S. (Bengal), was appointed to officiate as Professor of Midwifery Medical College, and Obstetric Physician and Surgeon, Eden Hospital, Calcutta, during the absence on leave of Lieutenant Colonel F S Peck, I.M.S. (Bengal), or until further orders.

THE undermentioned second class Assistant Surgeons, having completed seven years' service in that class, to be 1st class Assistant Surgeons, with effect from the 11th February 1908 —

George Francis Byers
Charles William Ernest Kern
Joseph Lee
Reginald Alexander Boermel
Martyrose Mackertich Owen John Apen
William James Coriden
Edward James Greson
Eugene Alfred St Romaine
Henry Lovell William Clark
Ernest Armin Canpiet Griffiths

CAPTAIN W FORRESTER, I.S.M.D., Civil Surgeon, Gujranwala, has obtained privilege leave of absence for three months, combined with furlough for nine months under Articles 260, 233 and 606, note (2) of the Civil Service Regulations, with effect from the 13th April 1908 or the subsequent date from which he may avail himself of it.

LIEUTENANT COLONEL C MACTAGGART, I.M.S., has been granted one year's combined leave to take effect from the time he became ill and unable to work as member of the Factory Commission viz, 26th January 1908.

CAPTAIN D S A OKFEFE, I.M.S., joined Civil employ Madras, from 21st February 1908.

WE observe that Lieutenant Colonel W B Bannerman I.M.S. Director of the Bombay Laboratory, now on furlough has been made an Associate Fellow of the College of Physicians, Philadelphia. This is a very rare honour, as the number of fellows is limited to fifty and of these only twenty can be foreigners, among the latter being Lord Lister and Sir Thomas Fraser, M.D.

We congratulate Lieutenant Colonel Bannerman and the Service on the honour thus done to him.

LIEUTENANT COLONEL W H QUICKE, F.R.C.S. (England) I.M.S., has been granted, from the date of relief, such privilege leave as may be due to him on that date in combination with furlough on medical certificate for such period as may bring the combined period of absence up to nine months.

HIS EXCELLENCY the Governor of Bombay in Council is pleased to make the following appointments, viz Lieutenant Colonel W H Quicke, F.R.C.S. (England), I.M.S., granted leave —

Major ASHTON STREET, M.B., F.R.C.S. (England), I.M.S. to act as Senior Surgeon, Jamshedji Jijibhai Hospital.

Major V B BENNETT, M.B., B.S. F.R.C.S. (England), I.M.S. to act as Second Surgeon, Jamshedji Jijibhai Hospital, and Presidency Surgeon, First District.

LIEUTENANT COLONEL A BUCHANAN, I.M.S., Civil Surgeon 2nd Class, is appointed to officiate as Civil Surgeon, 1st Class, with effect from the 4th September 1907, vice Lieutenant Colonel J L Peynder, I.M.S., Civil Surgeon, 1st Class on leave.

MAJOR W D SUTHERLAND, I.M.S., Civil Surgeon, 2nd Class, is appointed to officiate as Civil Surgeon, 1st Class, with effect from the 13th November 1907 to the 12th January 1908 (both dates inclusive), vice Lieutenant Colonel W A Quayle, I.M.S., Civil Surgeon, 1st Class, on deputation to Military Department.

PRIVILEGE leave for three months, under Article 260 of the Civil Service Regulations, is granted to Military Assistant Surgeon D O O Murphy, Superintendent, Central Jail, Raipur, with effect from the 15th March 1908, or the subsequent date on which he may avail himself of it.

CAPTAIN W H KENRIK, I.M.S., Civil Surgeon, Raipur, is appointed to officiate as Superintendent, Central Jail Raipur in addition to his own duties during the absence on leave of Military Assistant Surgeon Murphy, or until further orders.

CAPTAIN T HUNTER, Civil Surgeon, U. P., was on study leave from 7th November 1907 to 10th January 1908.

THE services of Major K V Kulkarny, I.M.S. (Bombay), are placed permanently at the disposal of the Government of Bombay.

LIEUTENANT COLONEL A M CROFTS, O.I.E., I.M.S. (Bengal), an Agency Surgeon of the 1st Class, Agency Surgeon and Administrative Medical Officer, North West Frontier Province, is appointed to officiate as Inspector General of Civil Hospitals and Sanitary Commissioner, Central Provinces, during the absence on leave of Colonel P A Wren M.B., I.M.S. (Bengal), or until further orders.

LIEUTENANT COLONEL F F PERRY, F.R.C.S. I.M.S. (Bengal) Principal and Professor of Surgery, Medical College Lahore, is granted furlough out of India for one year, three months and 23 days, with effect from the 8th March 1908.

MAJOR D W SUTHERLAND, M.D., C.M., I.M.S. (Bengal) Professor of Medicine, Medical College Lahore is appointed to officiate as Principal of that college, in addition to his own duties, during the absence on furlough of Lieutenant Colonel F F Perry, F.R.C.S., I.M.S. (Bengal), or until further orders.

MAJOR E V HUGO, M.D., F.R.C.S., I.M.S. (Bengal), is appointed to officiate as Professor of Surgery, Medical College, Lahore, during the absence on leave of Lieutenant Colonel F F Perry, F.R.C.S., I.M.S. (Bengal), or until further orders.

LIEUTENANT COLONEL PERRY is about to retire after a very distinguished career in India. He was educated at University College, London, and at Vienna, he took the L.R.C.P. (London) in 1876 and the F.R.C.S. (England) in 1890. He took the Herbert the Pukos and the Martin prizes at Netley. Before entering the service he was surgical tutor at Westminster Hospital. He has been for long attached to the Lahore Medical College, and had a great reputation in the Punjab as a surgeon and ophthalmologist.

MAJOR E V HUGO, I.M.S., who has succeeded Lieutenant Colonel F F Perry I.M.S., as Professor of Surgery at Lahore was educated at "Barts". He took the M.B. (London) with honours in 1890, and the B.S. (1st honours and Gold Medal). He followed in 1906 with the F.R.C.S. (Eng.). He entered the Bengal Medical Service in 1892 and took the Montefiore Medal, the Martin Medal and Maclellan prize at Netley, and had previously been Assistant Medical Superintendent of the Paddington Infirmary. He has been for many years a well known Civil Surgeon in the Punjab.

MAJOR SUTHERLAND has been for years past Professor of Medicine in the Lahore College and now becomes in addition Principal of the College. He is an M.D. and M.B. Edinburgh, with honours.

It is an open secret that many men expected that Lieutenant Colonel Perry would be succeeded by Major Henry Smith, of Jullundur, but *Dis aliter visum*.

CAPTAIN J O'LEARY, I.M.S., Assistant Plague Medical Officer, Jullundur, was transferred to Jhelum in the same capacity, and assumed charge of his duties on the afternoon of the 5th February 1908.

CAPTAIN W T FINLAYSON, I.M.S. whose services have been placed temporarily at the disposal of the Punjab Government by the Government of India in the Home Department, is appointed Superintendent of the Lahore District and Female Jails, sub *pro tem*, with effect from the afternoon of the 5th of February 1908, vice Captain A H Procter, I.M.S., whose services have been replaced at the disposal of the Government of India in the Home Department.

THE services of Captain E C Hodgson, I.M.S., are replaced at the disposal of H.E. The Commander in Chief in India.

CAPTAIN H B DRAKE, I.M.S., is appointed to officiate as Deputy Assay Master, Bombay with effect from the 28th of February 1908 or until further orders.

LIEUTENANT COLONEL F F MACCARTIE, O.I.E., I.M.S., is transferred to Calcutta as Assay Master with effect from the 4th of March 1908, Lieutenant Colonel Lloyd Jones, I.M.S., has gone on furlough.

CAPTAIN W M ANDERSON, I.M.S. an Officiating Agency Surgeon of the 2nd Class, is posted as Agency Surgeon in Keta and Jhallawar.

MAJOR W E SCOTT MONCRIEFF, I.M.S. (Bengal), an Agency Surgeon of the 2nd Class, is posted as Civil Surgeon of Kurram.

LIEUTENANT COLONEL T. E. DYSON, M.B., C.M., D.P.H., I.M.S., is granted, from the date of relief, such privilege leave of absence as may be due to him on that date in combination with furlough for such period as may bring the combined period of absence up to eight months.

HIS EXCELLENCY the Governor of Bombay in Council is pleased to appoint Major H. O. L. Ainslie, D.P.H., I.M.S., to act as Sanitary Commissioner for the Government of Bombay during the absence of Lieutenant Colonel Dyson, on leave.

HIS EXCELLENCY the Governor of Bombay in Council is pleased to appoint Mr. T. R. Clark, L.D.S., to act as Honorary Surgeon in Dentistry at the Jambhedji Jijibhai Hospital during the absence of Mr. C. Efford, L.D.S.

MAJOR J. H. McDONALD, M.B., C.M., I.M.S., is granted, from the date of relief, such privilege leave as may be due to him on that date in combination with furlough for such period as may bring the combined period of absence up to one year and three months.

WITH reference to Government Notification No. 945, dated 19th February 1908, His Excellency the Governor in Council is pleased to appoint Assistant Surgeon Rameshchandra Hanumanant Telang, L.M.S., to act as Civil Surgeon, Ranchi Mahals, vice Captain E. C. G. Maddock, M.D., I.M.S., pending further orders.

LIEUTENANT COLONEL G. F. A. HARRIS, I.M.S., Professor of Materia Medica, Medical College, Calcutta, and *ex officio* Second Physician to the College Hospital, was attached for a period of two months to the office of the Principal Medical Officer, Presidency and Assam Brigades.

CAPTAIN M. MACKENZIE, I.M.S., Officiating Resident Physician, Medical College Hospital, Calcutta, was appointed to act as Professor of Materia Medica, Medical College, and *ex officio* Second Physician to the College Hospital, in addition to his own duties, during the absence, on deputation of Lieutenant Colonel G. F. A. Harris, I.M.S., or until further orders.

LIEUTENANT COLONEL J. M. CADFILL, I.M.S., is transferred as Civil Surgeon to Ghazipur, U.P.

LIEUTENANT COLONEL KAVASJI HORVASJI MISTRI, I.M.S., Bombay, is permitted to retire from the service, subject to His Majesty's approval, with effect from the 4th March 1908.

SURGEON GENERAL W. R. BROWN, I.M.S., V.M.S., Surgeon General with the Government of Madras, is permitted to retire with effect from the 1st April 1908.

LIEUTENANT COLONEL J. L. VAN GEYZEL, I.M.S., Chemical Examiner, Madras, has applied for 18 months' combined leave from 10th May.

LIEUTENANT COLONEL K. O. SANJANA, I.M.S., was granted 6 months and 21 days' leave from 1st April 1908.

MAJOR C. ROBERTSON MILNE, I.M.S., has been granted 18 months' furlough from early in April, and Capt. L. Cook, I.M.S., officiates in charge of the Central Asylum at Berhampur.

CAPTAIN R. BRAYSON, I.M.S., got 6 weeks' privilege leave in March-April.

CAPTAIN P. P. ATAL, I.M.S., got one month's privilege leave from 29th February.

CAPTAIN E. W. BROWNE, I.M.S., acts as Superintendent, Govt. Lunatic Asylum, for 6 weeks.

CAPTAIN L. HIRSON, I.M.S., has been appointed to act as Civil Surgeon, Cochin.

CAPTAIN T. G. N. STOKES, I.M.S., acts as Civil Surgeon of Pachmarhi for the season till end of June.

HIS EXCELLENCY the Governor of Bombay in Council is pleased to make the following appointments:—

Major S. E. Prall, M.B., B.S., I.M.S., to act as Port Surgeon, Aden, and in medical charge, European General Hospital,

Aden, vice Lieutenant Colonel C. Monk, I.M.S., pending further orders.

Lieutenant K. G. Gharpurey, I.M.S., to act as Civil Surgeon, Aden, in addition to his own duties, pending further orders.

LIEUTENANT COLONEL J. G. JORDAN, I.M.S., has become Police Surgeon and Professor of Medical Jurisprudence in Calcutta, vice Major Hayward, I.M.S., gone on leave. Captain Weinman, I.M.S., acts as Civil Surgeon of Midnapur, vice Lieutenant Colonel Jordan.

MAJOR E. A. R. NEWMAN, I.M.S., has been granted 18 months' leave, and Major R. H. Maddox, I.M.S., has returned to Ranchi as Civil Surgeon.

MAJOR W. YOUNG, I.M.S., Civil Surgeon, is transferred to Cawnpore as Civil Surgeon, vice Lieutenant Colonel Bakor, on leave.

MAJOR ARTHUR H. MOORHEAD, I.M.S., read a paper on Plague in India at the meeting of the Association of Military Surgeons, U.S.A. It is an excellent summary of our knowledge of plague and is published in *The Military Surgeon* March 1908.

LIEUTENANT COLONEL T. GRAINGER, I.M.S., officiating as Civil Surgeon of the first class, is confirmed in that class with effect from the 17th February 1908, vice Lieutenant Colonel J. B. Gibbons, I.M.S., retired.

LIEUTENANT COLONEL J. G. JORDAN, I.M.S., Civil Surgeon Midnapore, is appointed to act as Civil Surgeon of the first class, with effect from the 17th February 1908, during the absence, on leave, of Lieutenant Colonel J. French Mullen, I.M.S., or until further orders.

MAJOR E. A. R. NEWMAN, I.M.S., Officiating Civil Surgeon of Ranchi, is allowed combined leave for nineteen months viz., privilege leave for three months under Article 200 of the Civil Service Regulations and furlough for the remaining period under Article 308 (b) of the Regulations, with effect from the 20th March 1908 or any subsequent date on which he may be relieved of his duties.

MAJOR R. H. MADDOX, I.M.S., Civil Surgeon, Shrihabad, is appointed to act as Civil Surgeon of Ranchi, during the absence, on deputation of Major R. Bird, C.I.E., I.M.S., or until further orders.

CAPTAIN T. H. DELANY, I.M.S., whom we are glad to see back to India in restored health, has gone to Allahabad as Civil Surgeon, having been transferred from the Eastern Bengal Province.

WE are glad to see in a recent issue of the *Calcutta Gazette* that Dr. Prokash Chandra Lahiry, Food Inspector in the Calcutta Corporation, has deposited a Government Promissory Note for Rs. 1,000 with the Civil Surgeon of Murshidabad for the maintenance of a bed in the Murshidabad Dispensary, to perpetuate the memory of his father, late Tarak Chandra Lahiry, who was for a long time Assistant Surgeon in Murshidabad. The donor has received the thanks of Government.

MAJOR F. K. OZZARD, I.M.S., has recently taken the diploma of the Royal College of Physicians in Public Health (D.P.H.).

LIEUTENANT COLONEL G. H. BAKER, I.M.S., Civil Surgeon, Cawnpore, is granted privilege leave, combined with furlough, for a total period of eight months and nine days, from the 12th March 1908.

SURGEON GENERAL J. P. GREANY, M.D., I.M.S., is granted, from the date of relief, such privilege leave of absence as may be due to him on that date in combination with furlough under military rules for such period as may bring the combined period of absence up to six months.

HIS EXCELLENCY the Governor of Bombay in Council is pleased to appoint Colonel J. McCloghry, F.R.C.S. (I), I.M.S., to act as Surgeon General with the Government of Bombay, vice Surgeon General J. P. Greany, M.D., I.M.S., proceeding on leave.

HIS EXCELLENCY the Governor of Bombay in Council is pleased to make the following appointments —

Captain W H Cazaly, B.A., M.B., B.S. (Lond) I.M.S., to act as Deputy Sanitary Commissioner, Gujarat Registration District, *vice* Major H C L Anum, D.P.H., I.M.S., pending further orders

Major H C L Anum, D.P.H., I.M.S., to hold charge of the office of Deputy Sanitary Commissioner, Central Registration District, in addition to his own duties as Sanitary Commissioner, pending further orders

LIEUTENANT COLONEL J CRIVMIN, V.C., C.I.E., I.M.S., has been allowed by His Majesty's Secretary of State for India an extension of furlough on medical certificate for six months

MAJOR K V KUKDAY, I.M.S., was placed on general duty, Bombay, from the 28th February to the 3rd March 1908

HIS EXCELLENCY the Governor in Council is pleased to appoint Major K V Kukday, I.M.S., to be Civil Surgeon, Than, and Superintendent, Nariotandas Madhavdas Lunatic Asylum, Naupada, *vice* Lieut Colonel K H Mistri, I.M.S., retired

CAPTAIN E C HEPPER, I.M.S., is appointed Civil Surgeon of Peshawar from 5th March, *vice* Lieutenant Colonel Denny, I.M.S., promoted to be A.M.O.

THE undermentioned officer is granted leave in India from the 6th September to the 31st October 1907, and leave out of India for one year in continuation from the 1st November 1907, on medical certificate under the Leave Rules of 1896 for the Indian Army —

Captain D Steel, I.M.S., late Officiating Assistant to the Director of the Bombay Bacteriological Laboratory Pension service, 4th year, commenced 1st September 1907

WITH reference to the Notification of the Government of India, in the Home Department, No 335, dated the 13th of March 1908, Major D W Sutherland, M.D., C.M., I.M.S., Professor of Medicine, Medical College, Lahore, assumed charge of the duties of Principal of that College, in addition to his own with effect from the afternoon of the 9th of March 1908 *vice* Lieutenant Colonel F F Poiry, F.R.C.S., I.M.S., proceeding on leave

WITH reference to the notification of the Government of India, in the Home Department, No 336, dated the 13th of March 1908, Major E V Hugo, M.D., F.R.C.S., I.M.S., Civil Surgeon, assumed charge of the duties of Professor of Surgery, Medical College, Lahore, with effect from the afternoon of the 9th of March 1908 *vice* Lieutenant Colonel F F Poiry, F.R.C.S., I.M.S., proceeding on leave

ASSISTANT SURGEON DIWAN ALI, in charge of the civil hospital, Ambala, is appointed to officiate as Civil Surgeon of Ambala, in addition to his own duties with effect from the forenoon of the 9th of March 1908, *vice* Major E V Hugo, M.D., F.R.C.S., I.M.S., transferred

ASSISTANT SURGEON DIWAN ALI was relieved of the charge of the civil hospital, Ambala, on the forenoon of the 10th of March 1908

CAPTAIN H WATTS, I.M.S., Assistant Plague Medical Officer, Ambala, is appointed District Plague Medical Officer, Ambala with effect from the forenoon of the 9th of March 1908 *vice* Major E V Hugo, M.D., F.R.C.S., I.M.S., transferred

MAJOR A W T BUIST, I.M.S., made over charge of the duties of Superintendent of the Sialkot district jail to Senior Assistant Surgeon Khazan Chaud on the forenoon of the 20th March 1908

MAJOR E S PELL, I.M.S., made over charge of the duties of Superintendent of the Gujrat district jail to Lala Krishn Chaud on the forenoon of the 23rd March 1908

CAPTAIN M FOSTER RYAN, I.M.S., acts as Deputy Sanitary Commissioner, F.B. & A., *vice* Captain C A Gourlay, I.M.S. on eight months' privilege and study leave

CAPTAIN R BRISON, I.M.S., got six weeks' privilege leave and was permitted to affix the Easter holidays to his leave

CAPTAIN P P ATAL, I.M.S., has been appointed District Medical Officer, Malabar

CAPTAIN M N CHAUDHURI, I.M.S., got four weeks' privilege leave from 2nd April 1908

CAPTAIN W C LONG, I.M.S., is due out from long leave on 16th August

CAPTAIN T W HARLEY, I.M.S., is appointed to act as District Medical and Sanitary Officer, Madurai

CAPTAIN D S A O'KEEFE, I.M.S., is appointed to act as District Medical Officer, Tinnevely

LIEUTENANT COLONEL RFFVES, I.M.S., applied for six months' combined leave from 28th April

LIEUTENANT COLONEL J L VAN GEYZEL, I.M.S., goes on 18 months' combined leave on 10th May

MAJOR W MOIRSWORTH, I.M.S., is due out to Madras on 4th June

MAJOR R H ELLIOT, I.M.S., F.R.C.S., has got seven months and three days leave up to 25th October 1908

THE address of Lt Col W E Jennings, I.M.S., the General Secretary, Bombay Medical Congress, is c/o Messrs King, King & Co, Bombay

Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs Thacker, Spink & Co, Calcutta

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs Thacker, Spink & Co, Calcutta

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BOOKS, REPORTS, &c., RECEIVED —

The Simplex Blind
A Guide to Sick Nursing in the Tropics Andrew Duncan (The Sci Press Ltd)
Fuchs Ophthalmology, New Edition
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Original Articles.

TYPHUS FEVER IN NORTHERN INDIA

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AND

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THERE have been many epidemics of typhus fever in N.-W. India at various times, but of late years it has attracted little attention. Were it more generally known how often it has occurred in this country, we venture to think it would be more often recognised than it is at present.

Epidemics which were probably typhus were described more than fifty years ago in the Yusufzai country¹ and Kohat². During the next twenty years several accounts of similar epidemics were published, and some at least of these seem to have been typhus^{3, 4}. In 1869 typhus was identified in Rawal Pindi Jail by Fairweather, and after that it was often recognised in the Peshawar Jail⁵. Many epidemics, some of them very severe, occurred between 1888 and 1894 and were described at the Indian Medical Congress. It was there stated that the disease was endemic in the trans-Indus districts, from Baluchistan to Yusufzai, and Hazara, and in the Himalayan hill tracts,⁶ more especially Kulu⁶. At the present time we should say rather that this area is liable to epidemics from time to time, and that it probably contains endemic centres.

Since the Indian Medical Congress, typhus has almost been forgotten in this country, but in 1905 it broke out in Peshawar in the first Mule Corps, which had just returned from the Thibet Mission. In the earlier part of last year typhus again broke out in the first, and later in the sixth Mule Corps, and about 120 cases occurred. During the past winter four isolated cases have occurred among the troops in Peshawar, in which the diagnosis was beyond question. Of these, one was a sepoy who had returned 18 days previously from the Haripur district of Hazara. In his house about the same time 3 deaths from "fever" occurred, and we have heard from other sources that a very fatal and infectious form of fever was present there in January and February last. One patient had just returned from Poonch and another from the Swat Valley. In the fourth case the source of infection was not definitely traced, but in all probability the patient was infected in the village of Dagh near Jalozai during manœuvres. One of us, when in Kashmir last year, met with the disease in a valley at an elevation of nearly 8,000 ft, where the disease is well known amongst the natives, and termin-

ates in August, when there is an exodus from the villages to the higher pastures.

EPIDEMIOLOGY

In all the epidemics of which we have seen any account the disease broke out in the winter. Most of them were limited to the months of February, March and April. One commenced in December and one in January only two lasted into June. It is in the winter of course that overcrowding occurs, during the hot weather the people live almost entirely in the open air. Exceptionally wet or cold weather by confining the people to their houses may predispose to the outbreak and spread of an epidemic, certainly, the last epidemic in Peshawar occurred during and after an unusual spell of rainy weather. From our experience in Peshawar it appears that while typhus as an epidemic is limited to the above-mentioned months, a few cases may occur in the early winter. It is remarkable that as soon as the hot weather is established, the disease immediately disappears. No doubt a bad malarial year predisposes to an epidemic of typhus, as appears to have occurred in the last epidemic in Peshawar, but epidemics have occurred in exceptionally healthy years also, as in 1891.

In the 1905 epidemic already referred to, much difficulty was experienced in checking it, and on two occasions when the disease had apparently ceased, it broke out again on the return of the corps to their lines, although these had been disinfected. In 1907 also the lines were evacuated. We found that in a large number of cases it was quite impossible to trace the source of infection, and that the disease spread from one troop to another almost as readily as it did within the same troop, although troops were isolated from each other as far as possible, and all intercourse was strictly forbidden. Whenever a case occurred, the patient and his contacts were most carefully isolated, but fresh cases continued to appear in the most disappointing manner until May, when the disease, according to its custom, disappeared. Among the contacts many cases occurred, usually after an interval of 5 to 9 days, but occasionally much later, and many sick-attendants were attacked. We can recall several cases in which all the contacts isolated, 4 or 5 in number, contracted the disease. One cannot, however, draw inferences from the above facts without taking into consideration the fact that typhus was present at the time in the city and some of the villages.

DIAGNOSIS

Neither the published accounts nor the textbooks are very helpful, and the following remarks are based on our own experience last year. The points on which we came to chiefly rely were as follows—

1. In more than half the cases the mental condition was more or less characteristic. The

patients were apathetic, dull and stupid, and could with difficulty be made to understand questions which, however simple, had to be repeated and paraphrased with the utmost patience. They were for the most part drowsy, and sometimes seemed to resent being disturbed. The nervous symptoms will be more fully described later.

2 The tongue was also much relied on for diagnosis. After the first two or three days, or occasionally from the commencement, it was exceedingly dry, and soon became swollen and cracked, it was caked with a patchy, rather thick, brown, or even black deposit on the dorsum. The sides and tip were often comparatively free, but red and sore-looking. Often it could be protruded with difficulty. Sometimes it was fairly free from deposit, and not swollen, but was then very red and dry, glazed and sore, and somewhat cracked. A very few cases retain a fairly healthy tongue throughout.

3 The rash, if present, is of course the principal criterion, but, unfortunately, not only may the rash occasionally be entirely absent, but where present, it is frequently so indefinite, so evanescent, and so difficult to see on a dark skin, as to give little aid in establishing a diagnosis. In some undoubted epidemics in Europe it is said to have been entirely wanting, and its frequency varies in different epidemics.

4 Lately we have placed considerable reliance on the examination of the blood. The differential count of the leucocytes is very different from that of most other fevers, there is a considerable leucocytosis, and the red corpuscles are increased in number. Further details will be given later.

An epidemic of fever lasting about 14 days and fulfilling the above conditions is, we believe, always typhus, but in the past it has sometimes been called "epidemic pneumonia."

It is very easy to mistake many of these cases for pneumonia, as indeed we did ourselves at first. The high temperature, and rather sudden onset, not unfrequently accompanied by pain in the chest, the flush, and the rapidity of the respiration, are all suggestive of pneumonia. The lungs show some signs of congestion of the bases, and often of bronchitis in the finer tubes, but we never heard tubular breathing, nor saw rusty sputum, nor did we find the pneumococcus. Later in the disease, it is true, true pneumonia is a not uncommon complication, but it usually occurs too late to confuse the diagnosis.

Other cases, again, seem to be clinically indistinguishable from remittent malarial fever, but quinine of course has no effect on them.

INCUBATION PERIOD

We have had cases in which this must have been at least 18 days and cases where it was probably only 5. We never obtained any history of premonitory symptoms during this period.

ONSET

The onset of fever was usually accompanied by headache and pains in the back and limbs. Many patients complained of the whole body being full of aches. The chest was sometimes the chief seat of pain. Sometimes, again, the pains and headache were slight or absent altogether. Except in mild cases, the patient's facies was a noteworthy feature in the clinical picture of the disease. There was almost invariably some congestion of the eyes, and in fair-skinned patients, a noticeable flush. The expression was either anxious, or in severe cases, dull and apathetic. In most of the cases which we saw from the commencement, there was at first a climbing temperature with a slight morning remission.

FEVER

The fever reached its height about the fourth day. The temperature ranged for the most part between 102° and 104° F, and continued for 10—15 days. We had undoubted cases in which the fever terminated at the end of 7 or 8 days. In one case the fever extended up to the 20th day, but this was never exceeded. Very few of our charts show temperatures exceeding 104° , and 105° was only once recorded. Although in a few cases the fever terminated in a distinct crisis, it was usually by a lysis which occupied about 2½ days. The morning remissions were not marked, but not uncommonly there was a considerable drop in the temperature, lasting for one or two days, at or soon after the middle of the attack.

HEART AND PULSE

The rapidity of the pulse was a feature of our cases. From the outset the rate was rarely less than 100 per minute, whilst by the end of the first week of the disease it had increased to 120, 130, or even 140. The condition of the pulse was a more reliable index of the severity of the disease than was the mental condition. The heart bears the brunt of the attack in this fever to a peculiar degree. Except in mild cases it early shows signs of weakness, and the high mortality of the disease is due to this great tendency to heart exhaustion.

RESPIRATORY SYSTEM

Bronchitis or broncho-pneumonia complicated quite 70 per cent of the cases. If the physical signs of these were absent, at least those of hypostatic congestion appeared later. A lobar pneumonia was unusual. The respiratory rate was higher than one would expect from the temperature or the condition of the lungs. A rate of 35 to 40 and over was common during the height of the disease, and this with little or no signs in the lungs beyond those of a slight bronchitis.

BY CAPTAIN J HUSBAND, M B, I M S , AND CAPTAIN R C MACWATTERS, M B, I M S

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NERVOUS SYSTEM

Except in the mildest of cases there were pronounced nervous phenomena throughout. On admission the patient's countenance had a dull and listless look. This was well developed as early as the second day of the disease, and became more pronounced by the fifth or sixth day, when perhaps slight delirium would set in. By the end of the first week low muttering delirium would be present at intervals throughout the day and night. The patient, on being spoken to, would reply only after repeated questionings, if he replied at all, and often resented being disturbed. Delirium, if not present during the day, was an almost constant feature at night, during some stage of the fever. A few cases developed delirium ferax. Many passed even as early as the fifth day into a condition of semi-coma. Profound coma was not often met with except in fatal cases, in which it was commonly associated with collapse and a sub-normal temperature. Patients might remain in this condition for four or five days, apparently moribund the whole time. As a rule, however, they could be temporarily roused out of their stupor to take nourishment. In the milder degrees of coma, patients would often obey simple commands, such as to protrude the tongue, yet they were unable to answer questions at all. In our experience, cases which recover show no improvement, as a rule, in the mental condition until some days after the fall in the temperature.

Towards the end of the fever the patients were often so weak that they were unable to turn themselves in bed or even in severe cases to raise the arm, and this prostration lasted well into the convalescent period, but once the convalescence was really established, the return to normal health was fairly rapid.

THE ERUPTION

A rash was present in fully 80 per cent of the cases, but only in very few was it so distinct as to be visible to an observer standing three or four paces from the bedside. So slight is the rash in the majority of cases that it is rarely noticed by the patient or his attendants, nor will it be by a careless or unfamiliar observer. A good light is essential—in the sunlight, in the open by preference, and below the axilla is the site to inspect. Here we often found good petechial spots when there was no definite rash elsewhere. Out of our 120 odd cases we saw only a score with well-marked rashes—rashes which in some cases were visible when standing a dozen paces from the patient, and in a dark-skinned man. A well marked rash always meant an extensive rash, we have seen the rash covering the whole body with the exception of the face, the soles and the palms. The rash was usually first noticeable about the fifth or sixth day. First seen below the axilla and on the sides of the chest, it would then appear over the deltoid

and over the back, with a few spots on the upper part of the abdomen. There was rarely any rash elsewhere. Where extensive, the rash was latest seen on the backs of the wrists, and on the dorsa of the feet and hands.

The rash, when typical, consists of two parts. There are small dusky reddish blotches, like those of measles, but they are smaller and fewer, and do not coalesce and produce the curious irregular pattern of that disease. These either from the first or after a few days become hæmorrhagic. Besides these, but less numerous, are small, rounded, pinkish, slightly raised papules. In a few days the rash all disappears, with the exception of the larger petechiæ which were sometimes present as much as 7–10 days after the temperature had fallen to normal.

Cases with a very pronounced rash were always severe, but on the other hand many of our worst cases had little or none.

OTHER FEATURES

The tongue we have already described. Vomiting was occasionally met with at the onset of the disease, but not later. The bowels were usually constipated. Jaundice was never seen. Epistaxis not unfrequently occurred about the time of the appearance of the rash. Relapses do not occur. For the first week or so of convalescence patients are frequently deaf.

SEQUELÆ

We met with no sequelæ worthy of mention. In the epidemic of 1905 some cases of gangrene occurred. So far as we can ascertain, none of our cases have had their health permanently affected in any way.

BLOOD CHANGES

The large mononuclears are increased in number. Love, after investigating 26 cases, states that there is a steadily increasing leucocytosis, the average count being 24,000. The red cells were slightly increased. Eosinophiles were absent or very scanty. We have only recently made systematic blood counts, but our experience, as far as it goes, confirms the above. In our differential counts the polynuclears were from 50–60 per cent, large mononuclears from 18–36 per cent, and lymphocytes from 5–15 per cent. Often no eosinophiles were seen in counting 500 leucocytes.

ETIOLOGY

Up to the present little attention has been bestowed upon the subject. The present position is as follows—

An increase in the large mononuclears is a feature of protozoal diseases, and is rarely seen apart from them. Calmette and others have described protozoa in connection with typhus, and Gottschlich⁸ has described a piroplasma from cases in Egypt. Almost simultaneously the piroplasma hominis was described by Wilson and

Chowning⁹ in Rocky Mountain fever. Their work has been confirmed by Cobb, Wesbrooke and Anderson, but contradicted by Stiles, who, however, examined only ten cases. Now, according to Sambon¹⁰ typhus and Rocky Mountain fever are identical, so, if we accept his view, the whole evidence for the protozoal nature of typhus is fairly strong. Now, the great majority of protozoal diseases are carried by blood-sucking insects, and in the case of Rocky Mountain fever, Wilson and Chowning accused the tick. It is difficult to incriminate it in the case of typhus, either in Europe or India. In Peshawar natives are not familiar with their bites, yet an epidemic which attacked over 10 per cent of the mule drivers, must, if conveyed by a blood-sucking insect, have been due to a species fairly common among them.

The *drabs* here commonly harbour pediculi, vestimentorum, and, of course, fleas and bugs fairly common in their lines. Mosquitoes and sandflies are practically never seen in the winter. Lice are not readily conveyed from one person to another, as they live in the clothes. They cannot live for long apart from their host, while the infection of typhus undoubtedly does. Again, the enforced cleanliness of prisoners renders them free from these pests, yet they are not exempt from typhus. Fleas also almost disappear in the winter, but one cannot quite exclude them as a possible cause. Bugs, on the other hand, are active all the year, and attach themselves to bedding and furniture. They feed repeatedly, and frequently from a fresh host. Capt Patton¹¹ has shown that the species of bug common in Europe, *Cimex lectularius*, is found in the N-W Frontier Province, but not in the rest of India. This curiously coincides with the distribution of typhus, which is rarely if ever seen down country.

Several facts in connection with the infectivity of typhus are best explained on the view that it is conveyed by a blood-sucking insect.

1. It is curious what diverse views exist as to its infectiousness. Sambon even questions whether it is infectious at all, and his article in Allbutt's "System" well shows what differences exist, as regards the infectious nature of both typhus and Rocky Mountain fever. Our own experience, so far as it goes, is equally conflicting. During the epidemic last year, most of the cases were followed by some or even all of their contacts or sick-attendants, but this winter we have seen several isolated cases which cannot have been connected in any way, and then contacts and sick attendants all escaped. The absence or presence of some carrying agent would explain such variations in infectivity very well. We satisfied ourselves that these cases were free from bugs or lice.

2. Typhus is essentially a disease of dirty people, living in overcrowded dwellings. Now, dirty people are the most likely to harbour

vermin, and in overcrowded dwellings the latter are most readily transferred from one host to another.

3. The infection hangs about bedding, buildings, and furniture to an unusual degree. The same is true of vermin, more especially bugs.

4. Typhus has been very generally attributed to bad ventilation, but this *per se* cannot be a very important factor. It has been known as "camp fever" because of its spread in armies living in tents. Under these conditions overcrowding certainly occurs, and with it easy means for the transmission of vermin from man to man. The men, too, often have to wear the same filthy clothes throughout a campaign. A few of our cases last year had been in bivouac without even tents, for three weeks or more at the time they first fell sick, and the removal of the Mule Corps to camp did not check the disease. Only the bedding of those who caught the disease, however, was disinfected, and it seems quite possible that infected vermin may have been present in the bedding of many others.

Some months ago, at a meeting of the Peshawar Medical Society, one of us read a paper suggesting the thorough destruction of vermin in dealing with typhus epidemics. Since then this has been put to the test by the Civil Surgeon, Capt Hepper, R.M.S., in an epidemic in the jail. Bugs were found in plenty in the hospital, where the cases had been infected, and on their destruction, the epidemic ceased. An account of this epidemic will, we understand, be published shortly.

We have failed to find anything like protozoa in the finger blood, the petechiæ, or in lice and bugs fed upon the patients. No fleas were examined and no splenic punctures were made. Further observations are desirable, and we hope that any who may have the opportunity will carry them out.

RELATIONSHIP TO ROCKY MOUNTAIN FEVER

This is fully discussed in Allbutt's "System" by Dr Sambon. There are some points, however, which we would like to add to the discussion. Typhus in India shows a very marked limitation to the spring months, and the same limitation is seen in Rocky Mountain fever. Again, Rocky Mountain fever has its true home in the foot-hills and lower valleys only. There is considerable reason to think that this is in some measure true of typhus also, as seen in India. In 1891, Hendley (5) made some interesting observations which we cannot do better than quote in his own words. "The villages," he says, "which were first, and throughout principally attacked, were on non-irrigated and high-lying ground overlooking the valley, and where those situated on low-lying and irrigated ground were attacked, direct infection from the former villages could be traced." As an example, it is curious that he chooses the village

of Jolozai, for, as already stated, one of our recent imported cases was probably infected in that neighbourhood, all the others had recently come from hilly districts.

It seems possible that the difference in infectivity and severity between the two diseases may be due to their being conveyed in a different manner, *e.g.*, by a tick in one case and by a bug in the other.

RELATIONSHIP TO "EPIDEMIC PNEUMONIA"

In the past it has often been stated that pneumonia of an infectious and epidemic nature exists on the North-West Frontier, and it has been very generally regarded as a specific disease, distinct from ordinary pneumonia. We have already pointed out how easily the diseases may be confused. True pneumonia, on the other hand, is particularly prevalent among the troops of this district. One epidemic is described by Duncan,¹² but he gives no evidence to show that his patients directly infected others, and his description reads like a very excellent account of ordinary pneumonia. Captain Stephenson, who has recorded another epidemic, tells us that the incidence among the sick-attendants was not greater than in the regiment generally. The 4th and 7th Rajputs recently suffered heavily from pneumonia in Chakdara and the Malakand, and they illustrate very well the nature of such epidemics. Both were down country regiments, quite unaccustomed to the rigours of the Frontier climate. The barracks at both these stations are dark and ill-ventilated, as in their construction defensibility was of necessity the first consideration, and this is true of many stations on the Frontier. At the Malakand one barrack has long been known as "Pneumonia barrack" by the officers stationed there, a name which rightly implies that the infection is endemic in the building rather than epidemic among the men. The fact is that when troops, particularly down country troops, are sent into ill-ventilated barracks on the Frontier, pneumonia is apt to assume almost epidemic proportions, yet the cases are clinically typical lobar pneumonia.

In striking contrast with this is an epidemic, also diagnosed at the time as epidemic pneumonia, which occurred in a regiment engaged on the Waziristan Expedition in 1895. Over 50 cases occurred, mostly fatal, and out of 13 sick-attendants 11 died. This was in all probability typhus. The epidemics of typhus which at one time decimated the jails of N-W India were for a long time regarded as epidemic pneumonia, and our own recent epidemic was given the same name by several medical officers at the commencement, though they admitted our diagnosis later.

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AN OUTBREAK OF TYPHUS FEVER IN PESHAWAR

By E. C. HEPPER,

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IN view of the fact that little is known regarding the method of infection in typhus fever, the following account of a small outbreak of this disease in the Peshawar Jail may not be considered without interest.

Between the 16th and 20th of March 1908 five prisoners in the jail contracted typhus fever. All these prisoners had been in jail for over two months, so they had evidently become infected in jail. On investigating these cases, it was found that four out of the five prisoners had been living in the hospital. Three of them were sick attendants in the hospital and one had been discharged recently after treatment for some other disease. This fact pointed to the hospital as the source of infection. The hospital wards differ from the ordinary wards, in that the patients are provided with iron cots to sleep on instead of the usual mud plaster bed, and that the floor is paved with pucca bricks. The cots were consequently examined and were found to harbour bed bugs.

These could not be seen on an ordinary examination, but on placing the cot on its side and striking it sharply on the ground several bed bugs would drop out. The habitual prisoners sleep at night in iron cubicles. These were also examined and a few bed bugs were found. As it has been suggested that bed bugs may play an important part in the spread of typhus fever, and as four out of the five cases of this disease had been exposed to their attacks, it was decided that besides taking the usual precautions of isolating the sick and contacts and disinfecting the hospital ward, all the bed bugs should be killed. The iron cots were accordingly stacked in heaps and were surrounded with the dry leaves of sugar-cane, and the leaves set on fire. An intense heat of short duration was obtained and all the bed bugs effectually burnt without any damage to the beds. The floor of the hospital was then covered with a layer of sugar-cane leaves, these were ignited and any bed bugs that had dropped on the floor and were lurking in cracks between the bricks were killed. The typhus cases and their attendants were provided with clean clothing and bedding and the sick were placed on the iron cots that had been

sterilised with fire, and they were all housed in tents in the jail garden. All the other sick in hospital were given clean clothing and bedding and placed in tents until the hospital had been cleaned and whitewashed. The iron cubicles in the habitual barrack were washed with a solution of Perchloride of Mercury 1—500 which was run into all the cracks and crevices. One case occurred on the 26th, six days after these precautions had been taken, and this was an habitual prisoner who had slept in one of the iron cubicles that had been found to harbour bed bugs. This was the last case of the disease.

Isolation of the infected cases and of the contacts has been practised in outbreaks of typhus without checking the progress of the disease and the sick attendants have often become infected.

In this epidemic all these precautions were taken, but all bed bugs were also destroyed and the sick had all their clothes and bedding changed. No sick attendant of the typhus cases got the disease. This is contrary to the usual experience, the sick attendant as a rule being very liable to become infected.

This may be explained by the fact that when a case of typhus is isolated, he usually takes his bedding and clothes with him, and if there are any bed bugs in these, they may get transferred to the sick attendant. This is an easy process from the habit the sick attendant has of sitting on the patient's bed and supporting his head on his lap. This method of infection was made impossible in this outbreak. Of the six cases one died and all had the typical typhus rash and temperature.

The interesting points about this outbreak were that *out of the six cases five had been exposed to the attacks of bed bugs and that the outbreak ceased when all the bugs were killed and infection by them was rendered impossible*, and that in no case was a prisoner attending to a case of typhus attacked by the disease, although they were in constant attendance on the sick.

In past years epidemics of typhus fever were constantly occurring in the Peshawar Jail, and the mortality from this disease was very high. During the past seven years, however, there has been no typhus in the jail until this last epidemic occurred.

It was thought that this freedom from typhus was due to the fact that the prisoners are now housed in barracks that are much better ventilated and better lighted than formerly.

The better arrangements in ventilation and lighting were, however, accompanied by the removal of all articles in the barracks that could possibly harbour bed bugs. The barracks contain no wood work and there are no beds, the prisoners sleep on mud berths which are freshly plastered once a week.

The hospital wards are well ventilated and the doors and windows admit plenty of light,

yet in spite of this typhus fever occurred and it was found that the iron cots harboured bed bugs. The credit given to lighting and ventilation may, therefore, be only partially deserved, and it is possible that bad ventilation and lighting are only indirectly responsible for typhus fever in so far as they conduce to infestation by bed bugs.

The experience of this little outbreak certainly tends to show that although there is as yet no definite proof that bed bugs carry the infection of typhus fever, there are good grounds for supposing that they may do so and that it is sound practice to act accordingly.

DEMENTIA PRÆCOX IN INDIA

By G. F. W. EWENS,

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A CERTAIN number of cases (and that not at all a small one) of insanity among young adults in this country, including both Natives of India and Europeans born here, present the characters of that disease described elsewhere under the name of Dementia Præcox. It may be summarised as a mental disease of adolescence which among Indian males at any rate is never recovered from, of prolonged duration commencing, rarely, with a simple change of disposition but oftener with a mild attack of excitement or with (perhaps most usually), one of depression, always showing hallucinations from the outset and later a peculiar tendency to grimacing, silly tricks of behaviour, a characteristic speech and manner, a peculiar combination of apathy, emotional dulness and defect of volition, the whole passing inevitably into a characteristic weakness of intellect in which very early defect of voluntary control over the sphincters and general feebleness of judgment and reasoning power contrasts markedly with perfect retention of memory to a very late period. Certain unusual physical symptoms accompany the disease throughout.

Whatever the objections and there have been very many urged in Europe against the use of this term of Dementia Præcox under which the similar cases met there are described, the question of its suitability as a name is of little moment compared to that of the existence of a distinct disease to justify such being classed separately, unquestionably, however, a definite clinical entity of this nature exists, the actual appellation most suitable for which is of absolutely no practical importance, and the writer's object in the present article is to describe the symptoms met with in a comparatively large number of patients mentally afflicted, seen in this country, who in his opinion are of this nature, the symptoms in all being fairly uniform, extremely characteristic, the patients in whom they appear being invariably incurable, so that a definite and certain prognosis can be given from the outset when they are once recognised (a conclusion it may be here pointed out very difficult to arrive at in most cases of insanity), the whole forming, at any rate, a definite and distinct clinical entity from a consideration of which we may say, at all events, that in young adults here a form of mental disease is met with presenting these symptoms which never ends in recovery, but always terminates in a characteristic Dementia that this is unlikely to be simply a peculiarity due to the period of life at which ordinary insanity has attacked these patients because we also often see in others of a similar age, ordinary mania and melancholia, but without these peculiarities characteristic of Dementia Præcox, in fact, all the usual forms of insanity quite indistinguishable from the

same seen at any other age and which then terminate in the usual manner.

We may therefore urge that any and every form of insanity in early adult life is not Dementia Præcox, for the ordinary clinical varieties are also then met with. That this disease, in other words, is not simply mania of adolescence and that it certainly does not comprise all adolescent insanity, but is a distinct and separate variety of mental affection. For while it must be owned that many of these cases do certainly give one an impression that perhaps it may be, that in some young adults from impaired congenital cerebral condition, when an attack of ordinary insanity occurs, the brain becomes so easily injured that recovery is impossible, and that for this reason they remain permanently weak-minded, yet against this and bearing largely in favour of this being a totally distinct malady is the indubitable fact that this weak-mindedness is always preceded by characteristic symptoms, that practically only those cases of insanity at that age with them do so terminate and more especially that the Dementia resulting is in itself characteristic and absolutely unlike that following any other mental disease.

Some objectors also urge that Dementia Præcox is an unsuitable name because cases have been described as occurring in other than young adults, but the writer is now speaking of insanies in India where as far as his own experience goes, the commencement of this malady is practically confined to the ages of between 15 and 25 and is never seen in older people.

In this country, as every one is aware, it is extremely difficult to obtain any previous history of a patient, and especially is this the case with regard to insanies. When such is available, however, the person afflicted with this disease is usually described as having been a very quiet, retiring, shy and self-absorbed youth, frequently as having been very studious, indeed, the disease seems here most common among those well educated (though I have seen well marked examples among illiterate Pathans). All are certainly, however, of a docile, amenable, quiet disposition, and I have yet to see an instance of it in a bully or ferocious character.

A history of masturbation is sometimes (not often) given, but this is nearly always really an early symptom and not an antecedent, even if true. However, such a large proportion of young natives do masturbate that this in itself would not be an extraordinary fact, but what is noteworthy and always worth enquiring into if the symptom is mentioned is whether the act was concealed, its not having been so is a very clear proof of its having been really an early symptom.

The large majority of the patients present some physical stigma, often several, and the most frequent are those common to so many insanies in this country: a) an inequality in the two sides of the face and of the halves of the vertex of the skull, the largest side of the face corresponding to the smallest side of the vertex, (b) defects in the ears, (c) hyperextension of the phalanges, and (d) flat feet. When a family history is obtainable, the patients will almost always be found to be of a neurotic stock. Some cases in whom there was a history of severe head injury preceding the onset have come under my notice, the accident has, however, always happened one or two years at least before the commencement of the disease while curiously the scars shewn as proof of the injury have always been of the frontal region of the skull.

The malady usually shews itself in one of two ways either (1) you are told that a patient has gradually changed in disposition, though he may have been formerly studious, you will be informed that he had left off work or ceased to persevere to attain the object of his study (I say he because the symptoms of this disease are of such a nature that the sufferers, if females, can conveniently be retained at home until very late, being rarely dangerous and still more rarely criminal, and of course no female without such characteristics would ever be brought to an institution, so that, it

results that very few, but males come under notice), he becomes untidy, hopelessly idle, singularly wanting in initiative or interest in anything. He is always wandering aimlessly about, frequently—remarkably frequently you are told that a young man in good employment quite suddenly goes away from it and is not found for some time and by this I mean that he will walk out of his workshop or office without reason or obvious motive, without notice or preparation perhaps in the middle of the day, without money with out a word to anybody in the clothes he stands up in, without baggage (a very striking fact in a European) and undertake a long journey by rail, if he happens to have money upon him, and if not, on foot. In one case, a young man at Karachi walked out of his post in his office in this way and was next heard of in Amballa.

Presently, the utter change in disposition and habits, the absolute cessation of all evidence of initiative and energy becomes so evident that the patient is brought for treatment as an insane. (2) The other type of commencement is either an outbreak of silly, petulance, restlessness and destructive violence, or a fairly rapid change of the patient into a condition of mild melancholia, when he is depressed, anxious, silent, until questioned, devoid of all initiative, slow, furtive in manner, sometimes in addition to being sleepless, refusing food and showing a tendency to dirty habits—obviously insane—giving either no comprehensible reason for his depression or some peculiarly silly, fantastic explanation or delusion, a peculiarity that strikes one forcibly throughout the disease. However it commences, a little cross-examination will reveal the essential feature of this affection which is never absent, and that is, the presence of hallucinations from the onset. The patient will tell you that he hears voices, that spirits talk to him, that birds speak, snakes come up and whisper to him that water rises in his room, that ghosts torment him, that leaves tell him various things, the content and description is usually silly and impossible, always changing and never forms a fixed or systematized delusion, the hallucinations are pre-eminently auditory, though visual are to a less extent met with, and sometimes those of taste and smell, although actual hallucinations are very rare.

Non, an ordinary, simple melancholic, such as these persons often appear at first sight to be, never has hallucinations, nor are these seen in mild cases of mania, while they are still more unusual in a person who has simply become weak-minded, vicious and lazy, and such a combination when there is no history of indulgence in Indian hemp or alcohol to account for the peculiarity stamps the case as almost certainly one of commencing Dementia Præcox, especially when it is noticed that unlike a young person with ordinary mania, or melancholia, there are no marked emotional outbursts, that also he is not "divertible," as it is said that the speech is different and that also he will usually eat, filthily it is often true, but still that he usually does and that he also sleeps more than does a case of ordinary adolescent insanity.

However he may commence, such a patient never recovers, and whatever form the initial state may have been, he soon lapses into either a chronic condition, typical of its kind, or else sinks rapidly and progressively into one of absolute dementia equally characteristic.

The chronic form is the most frequent termination and is also that one, from the habits of the people in which we usually see such patients in India. It is a condition that may last for many years (several of nine years duration having come under my notice), though its even tenor may be occasionally broken by outbursts of boisterousness and noisy restlessness or even impulsive destructiveness, usually of short duration, and it is curious that if you question such a patient after one of these, though unlike an ordinary case of mania, etc., he can answer sensibly and does usually. If asked for the reason of his conduct he can and will give no explana-

tion, but makes some stupid, frivolous reply, he adduces no explanatory delusion and has in fact no "insight" into his own condition.

The fully developed symptoms are fairly distinctive, the patient is curiously apathetic, shows very little initiative or desire for anything. As every one connected with an asylum is too well aware, the majority of patients in it if they are capable of framing a demand, invariably exercise this capacity in requesting you daily and all day to let them get out, you will notice that a case of Dementia Præcox never does so. From the first all employment, all occupation, is neglected and the patient rapidly becomes incapable of following his former trade or livelihood, and as the disease becomes well marked, it will be seen that not only is this so, but that there is the greatest difficulty in making such a one do anything, there is no active resistance to one's efforts but simply a listless inability. If a European, he will be on his bed all day, or if a native, will sit lolling in the shade of a verandah. Such a patient never assists in the asylum for instance, and so marked is this that if you see a man employed on any of the numerous trades and requirements of the institution, you may be quite sure he is not suffering from Dementia Præcox. Nor do such patients, like most others, at any moment come up and bother you with endless questions and requests and complaints. If they do anything, it is to avoid you, though this often is too much trouble. They will, as already said, sit about all day and literally do nothing, and, what is more striking, they seem to have no desire to try to do anything even to amuse themselves. Though many evoke to excess they have lost all interest in anything and everything, and nothing seems capable of arousing them to have any, and when they do move or act, these have all a peculiarly senseless, aimless character that is rather typical.

With this there is great emotional dullness, the patient never "gets excited" in the true sense of the word, he never has an outburst of emotional excitement, yet what seems a contradiction to this is frequent chuckling laughter "at nothing," as we say, which is very common as are (less so) intervals of weeping and crying, equally without reason, the laughter being without mirth and the weeping utterly without signs of misery.

This apathy and emotional dullness is very evident at the visits of relations. They do not, like other patients, hurry to meet them, shed tears of emotion, beg to be removed, and, after enquiring about home and people, part with them weeping. Quite the contrary—they go to the gate slowly and indifferently, stolidly, take all that is given which they frequently eat silently in front of them, looking at their visitors steadily without a trace of emotion all the time, never asking after their home, the welfare of the fields and cattle or of their women folk, and finally, go back to their room without remonstrance or resistance.

Yet they obviously comprehend everything said and done before them, remember all their past life, recognise everyone and fully understand where they are and who they are among.

At a very early period all these patients become wet and dirty, they nightly soil their bed, passing faeces and urine into it and in their clothes, while from the first they have become utterly regardless of any cleanliness or of personal appearance, and what is very significant, they never adorn themselves with rubbish like an ordinary chronic maniac, and though they never show any shame or consciousness of their filthy appearance, yet at the very time when they will act in this way and show the marked apathy and emotional dullness alluded to, yet, unlike an ordinary demented, they will be found to have—at any time absolutely perfect memory to be able, when they please, to speak coherently and readily, to walk about composedly and to be able to exercise volition. Indeed, this combination may give an unpractised observer the impression that such a patient is only filthy from laziness and viciousness. They do not, however, like some "maniacs," wantonly foul themselves

and their meals with excreta, and their acts in this respect seem to be only another instance of their general apathy and want of initiative. Still, a tendency to dirty habits and indecency is, however, very prominent in all these cases. They are nearly all filthy in regard to their excreta, many of them are constantly making obscene gestures and postures, many are always naked and others masturbate openly, and the trouble they involve for this reason in nursing and supervision is very great.

Then too they have a great and striking tendency to silly habits or mannerisms, everything about these patients' acts is "silly", they are always grimacing, putting themselves in some absurd posture, though with all this is done in a way that gives a superficial impression of cunning, and as though affected in impudence and purposely—all peculiarities which combined with their characteristic speech are absolutely typical of this disease and found in no other.

One man here at the sight of any one screws the eyelids forcibly together and "boos" as though blowing through paper instead of speaking—he also is usually naked, another when accosted invariably distorts his face to one side as though paralyzed (he is not), and replies with "all right" in a curious twanging tone, though quite capable of speaking sensibly, another stands on one leg resting the sole of the other on that, though at the same time putting his tongue out, and another boy stands stark naked and at the sight of an official bands his head forward until it about touches his toes, another, and he a European, if left for a moment, likes to strip naked and lie silently and at full length on his back directly in the middle of the garden path, others will emit one monotonous cry or word for hours together, a few will repeat several words in the same manner, and the varieties of this "stereotypism," as it is called elsewhere, are endless. A very large number will sing to themselves or on request, and it is worth remarking that their song is not an incoherent jumble but a repetition of something they have learnt long gone by, for with these people all previous knowledge is well retained until very late.

The epsech is absolutely characteristic (at least in the chronic variety), it is always fantastic and silly like their acts, but unlike that of a case of mania in whom the rapid flow of ideas and diversion of the attention by every passing sense impression—results in a sentence being often not completed and so appearing incoherent—that of a sufferer with Dementia Præcox, though often absurd in its content, is for each sentence a coherent whole, each sentence is finished, though each may be and usually is ridiculous, a reply will be given though often an absurd one. What are you doing now A? R—I am waiting for Lord G. to bring his yacht to my bedroom, sir, etc. What is still more striking than this is that extremely frequently the speech is given in an affected falsetto or mimicking voice. A European will imitate a cockney accent, a Pathan will use an ascending shrill tone, and another native will answer with the face drawn up to make some absurd grimace, in a voice that irresistibly reminds one of Punch at a Punch and Judy show, the examples that could be cited are endless. It is obvious from this that sustained conversation is impossible with them. The first impression given to one is that the man is certainly playing the fool and this is heightened by his acts and gestures. It is easily conceivable that it would be very difficult for a non-medical man to resist such an impression on seeing a young adult for the first time, who on being asked by him as to his health, replies with a mimicking grimace and in a cockney drawl "Oh we are 'awl' right here my good man," and when he sees such a patient when left alone sitting on the edge of the bed doing nothing with a sullen attitude, a feeble grin and senseless chuckle, wet and dirty, it is, one can imagine, very difficult for such a person to resist the idea that an individual so acting is only playing the fool or malingering, especially when the patient can be proved to be perfectly

oriented to have good memory and to look as all such do look, not ill at all, but in fairly good health and well nourished (many, however, it must be allowed, are very pale and anæmic). The faces at rest is placid except for the eyes which are usually bright and active, it is expressionless, though at other times this is replaced by a silly leer or fantastic grimace. The clothing is always untidy and dirty and often extremely filthy, the disregard for personal appearance being absolute. As before said, comprehension is unaffected and orientation unimpaired, while memory is, until the last, absolutely perfect, and the latter forms a very striking contrast to the patient's manner, appearance, behaviour and mental capacities. Not only past but present memory for events, time and place is also unimpaired.

The will is weak, that is to say these patients can be led about and directed by almost anybody, though they are always giving way to some impish trick or mannerism. A certain number show a dull obstinacy at varying intervals and the so called negativism of Katatonia must be separately referred to, but cases of ordinary Dementia Præcox do not, however, in this country show an opposition to suggestion and direction. They are not, as a rule, actively destructive, though they may be for short periods boisterous, restless with a tendency to break articles near at hand, a tendency perhaps best described as impulsive and purposeless. Of these actions they have perfect memory though they can or will give no explanation except perhaps a ridiculous one afterwards. A few show delusions always of a senseless, silly character. The patients described elsewhere in whom delusions are so prominent, as practically to constitute a distinct variety of the disease are in Indian asylums very rarely met with. The hallucinations remain about constantly from the outset, they are usually very distinct, and it is difficult to resolve them into illusions. They may be annoying in character, but are never fearsome and never lead to violence or retaliation.

The movements are slow and apathetic, though some of the tricks and mannerisms are quick, these too may be of an irritating character.

Prolonged observation of all will assure you that they are perfectly conscious, have full knowledge of where they are and who they are surrounded by, and also of time, that is to say, that their apprehension is perfect orientation and "consciousness" unclouded, nor have we here noticed any defect even in the cases of more acute onset. In all this they contrast strongly with the ordinary dement, or with crises of acute mania, chronic melancholia or any variety of insanity from drugs or exhaustion. They do, however, exhibit a great weakness of judgment and their speech and conduct also lead one to imagine, at any rate, that there is a great poverty of ideas and their loss of control is shown in their tendency to the aimless, impulsive actions, which characterise so many, while they also have the usual self-satisfaction with their own conduct and behaviour seen in all cases of mental disease, just as like all these it is utterly impossible to reason with them or to arouse them in any way from their condition of apathy, stolidity and dulness. They have no "insight," as it is said, into their own condition unlike many cases of melancholias, etc., and on account of their very dulness and the total abolition of all interest in anything and everything, attention appears to be very defective, or at least even if control over it is possible, there is no effort at effecting it.

Physically, the frequent presence of stigmata of degeneration has been already alluded to, there is no marked evidence of constitutional disturbance, though in the very young examples these are often here—weak and ill nourished and frequently anæmic, with ordinary care in any asylum these, however, grow to maturity and normal stature. There are, however, one or two striking organic peculiarities. Nearly all these

patients if they do not actually have an excess of saliva formation, at any rate give one the impression that they do, for the majority are perpetually spitting. The quantity of urine is also apparently in excess, though from their habits it is not possible to accurately estimate its amount. The patients are certainly not constipated, but show a tendency to great looseness of the bowels. The pulse is usually quick and of bad quality and remains so throughout while there is always a marked affection of the respiration. Usually this is very infrequent, 10 to 8 a minute being sometimes seen, but in other cases it is rapid, but this is extremely enervated, almost imperceptible, in all it is liable to great alteration during examination when a patient will frequently cease to breathe for 30 seconds or longer, and what is more remarkable, when he does recommence, there is no marked acceleration such as there would be after such an interval in a normal person.

The reflexes are, if anything, rather more easily obtainable than in health, but not to any very marked extent. In a few, a very few, the symptoms show a modified remission for some time, they become quiet, apathetic, obedient and not demonstrative and in this condition are occasionally removed by friends. But it will be seen that even at their best they are utterly changed from what they were before admission, and they are always incapable of following their original employment, and the disease almost invariably recommences and then their filthy habits, the difficulty of caring for them and the trouble they give on that account almost invariably necessitate their being sooner or later returned to the asylum where they stay until death. This may be delayed for many years, in one case here it did not occur until advanced middle life, though in the large majority some intercurrent disease, frequently phthisis, carries them off long before that period. No treatment hero has been ever found of any service, and the pathology of their disease is still a matter for discovery.

A very excellent example of the disease is presented by a young European (born in this country) who has been in this asylum since 1905.

It appears that he is a tailor of most respectable parentage who had received an excellent education and had been sent to England when 20 to learn his father's trade, but while there had wasted his time and given way to vice and riotous living. He was brought back to India and was 'set up in business' on his own account, but soon failed by reason of his negligence and intemperance, and on this happening, enlisted only to be discharged as useless after some five months' service. He then appears to have wandered about the country, as do so many of these cases, and finally drifted to the local workhouse from whence he was sent to this asylum for treatment and has remained here ever since. It is noteworthy that he was noticed in the workhouse to masturbate freely, but there is little doubt that his disease had commenced in England and that the vice was only another example of his impaired intellect and loss of control, as were his indulgences, intemperance, loose conduct and his inability to earn his own living anywhere, for on arrival here his disease was already far advanced and in a chronic condition. Though perfectly able to speak sensibly and with accurate memory, he would give absolutely no details of his previous life, talked and replied in a hesitating fashion, was extremely reticent, pretending ignorance on all matters, personal and private, so that his previous history was only obtained later from his relations. He seemed morose and a little dejected, lay like a log in bed all day, was untidy and uncleanly, acted as though of defective intelligence and was utterly lacking in interest in his position or welfare, made no remonstrance as to his detention, and indeed seemed not to trouble in the slightest about the matter, was devoid of shame and self-consciousness, absolutely indifferent to his surroundings and careless of the future.

He was a big ungainly youth with bright twinkling eyes but a fat immovable face (except when this was contorted into a grimace), thick everted lips and rather large outstanding ears, always, when off his bed, standing in a slouching nerveless attitude with the head bent towards the ground.

He appeared to have no desires or interest in life except perhaps what might appear so in his craving for tobacco. Although there was no history obtainable of any acute "emotional" onset to his disease since coming here, he has had occasional outbursts in which he behaves either like an ill tempered, pettish child or is foolishly destructive and noisy and inclined, though he is a great coward, to bully the native servants, and with these exceptions he has never varied. He has none of the obvious self satisfaction and obtuseness of the chronic maniac nor the depression of the melancholic. He is not "divertible" nor obstinate, can be led about and controlled by anyone, and though he has occasionally thrown away his food, etc., usually eats greedily and voraciously. He is full of tricks and mannerisms, will stand for long periods in one attitude, will take off his clothes and stand naked at the main gate, will lie on his back, also naked, in the middle of the main garden path and is in fact always posturing and grimacing, mimicking a Frenchman or imitating somebody—the only occasions on which, it may be added, that he speaks of his own accord. Yet it can be proved that he has perfect memory, both past and present, retains all his past knowledge and education. He can speak sensibly and reply accurately and to the point, but in general his language is silly, fantastic, though each sentence is coherent in itself, its content is absurd and ridiculous often as though purposely so, and it is impossible to carry on a conversation with him. From the first he has been very filthy, he passes his excreta in his bed or clothes, and when asked the reason why, mimics a French accent and usually replies "I am sure I don't know, sir, shocking, isn't it?" and is deaf to all remonstrance or appeals to his better sense.

His attention is indifferent and difficult to arouse. Though emotionally dull, he is obviously pleased when asked to sing a comic song, of which he has a large repertoire, and one of which he gives in a horrible voice with huge delight, figuring and posturing to illustrate it, often stark naked without the least self consciousness. He allows his clothing to become soiled and torn, and nothing will induce him to keep himself clean or tidy, or to occupy or amuse himself in any way except in posturing or grimacing, laughing in a silly, senseless manner or talking in some silly, ridiculously affected way, which often gives one the impression that he is playing the fool and acting intentionally of set purpose. But with all this, when visited by his mother, he displays not the slightest emotion (and though he used at first to write and that fairly sensibly, though always for the purpose of making some ridiculous request), never asks after the welfare of any of his family, never demands to be taken away, and parts from her stolidly, taking everything she brings, devouring greedily all the eatable portion, and behaving then as on all occasions more like a dirty, untrained, silly, pettish child than the well educated man he really is. At first he had fleeting delusions of wealth, etc., and of friendship with many titled persons, with hallucinations of hearing, but with his increasing weak mindedness these are now difficult to elicit. For the last year he has been absolutely stationary, filthy, incapable of reasoning or judging, apathetic, indifferent to everything, the picture of dirtiness and untidiness, yet capable of quick, active, impulsive movements, active in the search for food or tobacco, with absolutely perfect memory, and a speech that is unlike any other variety of insanity but that of the instances of the disease under discussion.

As is well known, this disease is divided by Kraepelin and others into three forms (1) hebephrenia which practically includes the cases, of which a description has just been attempted, (2) a paranoid form in which

delusions are the most prominent feature, masking all the other symptoms, and (3) katatonia, a description of which latter, as met with here where it is a fairly common disease, must be reserved for a future paper.

The paranoid form is in India, at least as far as my experience here goes, extremely rarely seen. We have here at present, however, two cases, one is that of a powerful young frontier man, always naked, perpetually smiling, grinning and chuckling, with silly laughter and self satisfied, whom on account of his habit of annoying the others, we find it necessary to keep always shut up by himself unlike any ordinary insane native, and despite his definite delusion of grandeur, he never makes any objection to this and never begs to be allowed out or to go away, never desires to send letters, and is perfectly content to sit or lie, doing nothing the whole day—at most asking for a cigarette, it is surprising what a desire there is (practically the only one) for this amusement among these cases. This man also shows typically the usual apathy, emotional dullness, indifference to everything and everybody, the inability to employ himself or to carry on any sustained conversation, and the senseless gestures, tricks and mannerisms and grimaces so characteristic of this disease. But also on arrival he declared that he was a near relation of the Prophet and cited hallucinations of voices to support his contention and claimed all sorts of wonderful senseless powers and capacities in consequence, and also modified his conduct to a certain extent on this belief. As usual, however, as time advanced (he has been here since 1905), these delusions faded and are only now recalled on questioning, and probably with advancing dementia will practically cease altogether.

A Mirror of Hospital Practice.

SOME OBSERVATIONS ON CATARACT EXTRACTION *

By R. H. ELLIOT, M.D., B.S. (LOND.), SC.D., F.R.C.S. (ENG.), ETC.

MAJOR, I.M.S.

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SOME twelve years ago, a distinguished member of this branch told me that "anyone could take out cataract." I disagreed with him then, inasmuch as it appeared to me that it was not so much the "taking out" of the cataract that mattered, as the way it was done. The years which have passed away since then have only served to strengthen my early belief, so much so that after having extracted some six to seven thousand cataracts, I am more conscious than ever how much there is to learn.

THE SELECTION OF AN EYE FOR OPERATION

In a famous European capital, I saw a surgeon, whose name was well-renowned, take a

* A paper being read before the Madras Branch of the B. M. Association on December 20th, 1907.

cataract patient out of his O P room, and place him at once on the table for extraction, the excuse he gave was that the patient might not consent to the operation, if it was delayed. I hold such a procedure to be wrong on principle. No patient should be submitted to operation, till he has been kept a few days under observation, and till it has been thereby established that the adnexa of the eye are in a healthy state. Our practice in this hospital in dealing with apparently healthy eyes, is to admit the patient, and have his eyes inspected the first thing in the morning. The Assistant-Surgeon goes round early before the patients have had time to wash their faces, and carefully surveys each selected eye. If he finds that there is no secretion, he places a small green ticket on the notice-board, and it is thus easily known that the patient is ready for operation. If on the other hand, he finds sticky discharge closing the eyes, lying in the inner canthus, or coating the lid margins, he places a red ticket on the patient's board and so relegates him to the squad "under treatment." He requires to be on his guard, for the system of red and green tickets is now widely known, and many who are anxious to get an early release from hospital by operation, will get up early, wash their faces and then lie down again with an appearance of innocence that would deceive a detective. To obviate the danger of our being caught in this way, another barrier is interposed, and every selected eye is subjected to 24 hours of an "experimental bandage" before operation, each such bandage is opened on the morning of operation, and the state of the conjunctiva and cornea is again carefully noted. If there is evidence that the shutting up of the eye has caused irritation of the above membranes, operation is postponed for the sake of further treatment.

To bring an eye with an inflamed conjunctiva into a healthy state is not always a simple matter, and not infrequently the use of strong measures delays the desired result. Under such circumstances the use of chincol solution, of aigylol, or of weak protargol and other such non-irritating remedies proves very valuable. On the other hand, recalcitrant cases with a large amount of purulent discharge often yield best to strong silver or to forcible friction with a 1 per cent solution of perchloride of mercury. In all such matters judgment and experience play an important rôle.

When there is obstruction or inflammation of the lachrymal passages, extirpation of the sac is a valuable measure and one I resort to without the least hesitation. It has been performed 325 times in this hospital during the last three and a half years.

The bacteriological examination of the conjunctiva in every case is unfortunately impossible here at present owing to the large numbers we have to deal with.

THE PREPARATION OF THE PATIENT FOR OPERATION

Lt-Col Herbert, I.M.S. (ret'd), has for many years advocated the antiseptic treatment of the conjunctiva before operation. At one time I gave this method a trial, but unfortunately dropped it, discouraged by a few bad results. I therefore confined myself to a careful scrubbing of the conjunctiva by means of cotton wool swabs mounted on small sticks, and carefully sterilised in the steam steriliser. Even with the greatest care I found that at times I failed to exclude sepsis, and I was therefore induced to give Herbert's method another trial. It is as follows—Some 10 minutes before operation the everted lids are exposed for from 1 to 2 minutes to a stream of perchloride lotion (1:3000). To quote Herbert's own words in a letter he wrote me "the perchloride imprisons the organisms in the mucus, whose secretion it excites, all mucus and filmy exudation is removed by movement of the lids under a stream of saline fluid, and by a touch with gauze if necessary." It at once occurred to me to combine Herbert's method with my own, and thus I now invariably do. An assistant applies the perchloride according to Herbert's directions, the patient comes on the table, and there I swab out the conjunctival sac to its farthest recesses with sterilised wool swabs under a stream of boiled water, poured out of a boiled irrigator. The results have been most gratifying, as may be gathered from the following facts.

The records of the hospital show that in 1897, out of 1,161 cataracts extracted there were 98 failures. The figures are taken from my predecessor's notes in the operation register of the hospital—

Total No of cases	Suppuration and Panophthalmitis	Suppurative Iritis and Keratitis not ending in Panophthalmitis	Non suppurative Iritis	Unclassified failures
1161	18 or 1.55%	15 or 1.29%	38 or 3.27%	11 or 0.94%

The remaining 16 are attributed to causes other than sepsis.

In 1902 I published in the *Lancet* the results of 750 cataract extractions, performed in the hospital in 1901 and 1902 (June 1901 to February 1902). The following table shows the results so far as sepsis was met with—

Total No of cases	Panophthalmitis supervened in	Suppurative Iritis and Keratitis not ending in Panophthalmitis in	Non suppurative Iritis in
750	3 or 0.4%	16 or 2.13%	15 or 2%

In 1907 I commenced to use Herbert's method in combination with my own. At first a few cases were selected for it out of each batch, but later the combined method was adopted as a routine for all cases, and is so to-day.

Comparative Statistics of Septic Incidence and of failure of vision due to Sepsis in 1897, 1902 and 1907

YEAR	Total number of cases dealt with	Number of cases of Panophthalmitis	Number of cases of Suppurative Iritis and Keratitis	Number of cases of Non suppurative Iritis	Number of cases of unclassified failure (presumably septic)	Percentage Index of septic incidence	Number of cases of failure of vision due to sepsis (p 1 or less)	Percentage Index of loss of vision due to sepsis
	1	2	3	4	5	6	7	8
1897	1,161	18 or 1.55%	15 or 1.29%	38 or 3.27%	11 or 0.94%	6.11 to 7.05% (according as the unclassified failures are excluded or included)	75	6.11 V=0 or p 1
1901-02	750	3 or 0.4%	15 or 2.13%	15 or 2%	Nil	4.53%	24	3.2%
1907	725	1 or 0.13%	1 or 0.13%	0 or 0.8%	Nil	1.06%	2 to 3 (According as the doubtful case is included or excluded)	0.275 to 0.4%

From October 1906 to October 1907 I extracted 725 cataracts, of which the eyes had been prepared for operation in this way. The results are as follows —

Total No of cases	Panophthalmitis supervened in	Suppurative Iritis in	Subacute Iritis in
725	1 or 0.13%	1 or 0.13%	6 or 0.8%

In the case of panophthalmitis, the lachrymal sac of the same side had been submitted to operation by another surgeon. It was unfortunately assumed that the extirpation had been complete, an assumption which a careful examination subsequent to the disaster proved to have been ill-founded. Of the cases in which I have myself extirpated the sac, and subsequently removed the lens, all have done well, and it was a confidence so engendered which led me to assume all was well in this case. I cannot sufficiently regret that I was not more sceptical. Subsequent to the 725 cases we are considering, 169 more extractions have been performed here up to the present date, without another case of panophthalmitis. This makes a total of 894 (see postscript) with one case of panophthalmitis, one reflects with pity and regret that even that one was unnecessary.

The case of suppurativeritis ended in loss of vision.

The six cases of subacuteritis were of a mild type, as may be gathered from the final vision of five of them, which was respectively 5/30, 5/20, 5/20, 5/15 and 6/5. The sixth case occurred in a young man suffering from congenital cataract, and the final vision was only H M. It seemed likely that this result was due more to antecedent fundus changes, than to the inflammatory condition. In any case it will be observed that only in 3 (0.42 per cent) at the outside can sepsis be held accountable for loss of

vision, though it may have lowered the final result attained in four others.

It will be observed that the percentage index of sepsis after extraction which stood at 7 in 1897, fell to 4.53 in 1902, and to 1.06 in 1907. If the index of sepsis destructive to vision (i.e., responsible for a vision of less than 5/30) be taken for 1907, it stands at from 0.275 per cent to 0.42 per cent according as we count in the doubtful case above alluded to or not. I lay some stress on these figures, because the claim has been urged that the extraction of a lens in its capsule removes the element of danger from inflammation, which we must encounter if we leave the capsule behind. I hold most strongly that deep-seated inflammation of an eye after extraction is due to sepsis and that to take any other view of the case is a mere 'burying of one's head in the sand'. I would wish to be clearly understood that in so saying, I make no reflection on the operation of extraction within the capsule, towards which operation I have always kept an open mind, and which I leave with confidence to the test of time and experience.

STERILISATION OF INSTRUMENTS

For a long time past we have boiled all the instruments used. Even the knife, needle and scissors are so treated. This no doubt shortens the life of cutting instruments, but it adds greatly to the safety of the operation. Even as it is, a knife or needle will last for 20 or 30 operations, and a pair of scissors for about 100. If you will watch an inexperienced operator at work, you will observe that he frequently allows his knife or needle to rub on the margin of the lid whilst he is introducing it. He is so much taken up with his section that he has no eyes for the rest of his knife. It is obvious that this is a dangerous proceeding, and one that needs careful avoidance. My practice is to rotate the

eye inwards by means of the forceps during puncture and till the moment of counter-puncture, the eye is then brought back to the mid-line for the finish of the section. In this way the lid-margin is easily avoided, more especially so, if the temporal lashes of the upper lid have been cut short the day before operation, as is always done here.

Another point often overlooked is the care of the speculum. One frequently sees an operator brush the sterilised speculum on the lid-margins whilst inserting it. If the assistant depresses the lower lid, whilst the operator raises the upper, and at the same time introduces the speculum with care, there is not the least reason to contaminate the instrument.

No instrument should be used twice without being sterilised in between. It might seem unnecessary to insist on the importance of not allowing the operation ends of the instruments to touch the operator's hand, the pillow, the patient's face or anything else, except the eye, but I have seen these kinds of accidents happen so often that I am sure the warning is not needless. The fact is, that the surgeon has so many things to think of (until his experience is so large that he operates without conscious effort), that he may very easily forget these important details. If I may compare great things with small, it is like the tyro at golf, whose head is so full of the many things that he must and must not do that he often ends by missing the ball altogether.

ON SOME COMMON MISTAKES IN TECHNIQUE

I have frequently been asked by surgeons who do a certain number of cases in the district to give them some operations in the hospital, and to advise them how best to perform them. I should like to take this opportunity of saying how much pleasure it always gives me so to do. What has struck me most forcibly is that practically every man who has not had large practice makes the same mistakes. To meet this, I venture to give a few short rules for the guidance of beginners—

- (1) Never be in a hurry, there is lots of time.
- (2) Take a light hold with the conjunctival forceps, and avoid pressure on the globe. It is this forceps-pressure on the globe that leads to so much vitreous escape. The object of the forceps is simply to steady the globe.
- (3) For tearing the capsule, choose a needle (Bowman's) the shank of which is at least as big as the blade. Too large a blade means too large a cut, and consequent leakage alongside the needle during laceration. Such an accident need never occur with a suitable needle.
- (4) Enter your knife point in the needle puncture, it will slip through more easily and fill up the hole at the same time, thus avoiding aqueous leakage.
- (5) Do not rotate the knife on its axis or aqueous will escape.

(6) Do not carry the counter-puncture back into the sclerotic, it adds much to the difficulty of the section. Learn to bring it out in the corneoscleral junction. This is more difficult than it sounds.

(7) On making the counter-puncture, push the blade boldly on, with a sawing movement, so as to make a large part of the section in the first cut. At the same time, turn the edge of the blade slightly forward, so that it may ride harmlessly over the iris. This turn should be made almost with the counter-puncture. It saves the iris from being scraped.

(8) Cut in the plane of the knife-blade, and not at an angle with it. If this direction is obeyed, a sharp knife cuts its way out *without effort*.

(9) Do not attempt brilliant sections. Finish your section slowly and gently. This will minimise the danger of sudden squeezes of the lids, which are likely to cause vitreous escape.

(10) To minimise the size of the artificial pupil, seize the iris at its pupillary edge with a narrow grip, and cut holding the scissors at right angles to the corneal section.

(11) Do not pinch the iris with the forceps, but seize it as gently as possible. Also avoid all drag on it. You will thus give your patient no pain, he will not shrink, and you can do your operation easily without fear of pulling the iris edges into the section, and impacting them there.

(12) Make your section big enough for easy delivery, small sections spell disaster. You should learn by the use of the needle during laceration of the capsule what kind of lens mass and to some extent what size of lens mass to expect, and you can graduate your section accordingly.

(13) Be content with the delivery of the nucleus and any cortex which readily accompanies it by manipulation. Any thing left can easily be washed out. This is a safe and an easy procedure.

(14) Replace the iris thoroughly. This can be done with the irrigator stream directed under the iris, or over its surface, or placed on the lips of the wound from outside, according to the case. Failing these, use a curette, or seize each iris edge in turn with iris forceps and pull it into place. One should not rest content till a key-hole pupil is obtained.

(15) If the pupil looks very black, and the vitreous body presses against the cornea, obliterating the aqueous chamber, it is a sure sign that the hyaloid membrane is thin and that vitreous escape will ensue if the operation be pushed.

(16) Never interfere with an opaque posterior capsule left after delivery of the lens. It is more safely and better dealt with later by dissection, after the section is soundly healed.

(17) Remove floating portions of the anterior capsule with iris forceps, but be ready to close

the eye at once, if the vitreous threatens to present in the wound

(18) A mass of cortical matter is often found impact below the sclerotic lip of the incision, having broken off from the nucleus in this position when the edge of the latter made its way forward to escape by the incision. Such a mass is contained in its corresponding portion of capsule. If the latter be seized and drawn toward the pupil, the cortex is emptied into the chamber and can be easily washed out, the capsule should be removed first in the grip of the forceps.

(19) If a lens fails to present in the section, when pressure and counter-pressure are applied, the failure may be due to (1) insufficient laceration of the capsule, (2) dislocation of the lens upward beneath the sclerotic lip of the incision, (3) falling down of a Morgagnian nucleus into the lower part of the chamber, (4) too small size of incision, (5) if iridectomy has not been done, to rigidity of the iris, and (6) if the suspensory ligament of the lens has ruptured, to the lens having fallen backward into the vitreous.

Insufficient laceration is met by lacerating the equator of the lens with a knife or needle, through the section.

(20) Great care should be taken to avoid a lens delivering by rotation on a horizontal lateral axis (right-to-left axis), this puts a dangerous strain on the hyaloid membrane, it is due to dislocation of the lens under the sclerotic lip, the upper part of the lens becomes fixed there and the lower can only deliver by turning upwards and forwards on the horizontal axis. This should never be allowed, the lens should be replaced in position by pressure with a curette and then delivered.

(21) A lens which is a tight fit for its section may often be delivered quite easily by rotating it when once impacted in the section on its antero-posterior axis, this can be done with a curette applied to the edge, and stroked round it, the action is like that of turning a cart-wheel on its axis, by seizing the tyre and turning it round.

(22) Amongst many things which I owe to Captain Kirkpatrick, I.M.S., is the knowledge of a most useful little manoeuvre, as simple as it is ingenious. When the chamber empties during needling, owing to the blade of the needle being too large, or to the knife having been introduced with its edge the wrong way, or to any other cause, the chamber may be easily refilled, through the small puncture already made, by pressing the nozzle of the irrigator against the puncture, and turning on the stream. One is at once placed again in the position of working with a full chamber.

ON METHODS OF DRESSING THE EYE

There has been some discussion of recent years as to the best method of dressing the eye

after operation. Whatever may be the merits of the open method (in which no bandage is used) in other countries, it has no place in a dust-laden land like India. On the other hand, I am persuaded (as the result of comparative observations recently made) that it is a mistake to use bandage-pressure on the eye as a routine measure, the tendency thereof is to cause the corneal flap to overlap the sclerotic, and thus healing in faulty position is obtained. All that the bandage should aim at is to *gently close the eye without pressure, and to exclude light and dust*. When the section tends to gape, then pressure may properly be applied. On the other hand, when the eye has long been the seat of catarrhal or other conjunctivitis, and it is expected that the discharge will be unduly free, it is most desirable not to lock up purulent secretion in the conjunctival sac. Our practice then is to apply a shield, with a layer of absorbent wool on its outer surface. This permits the secretion to escape freely. If a case has been under active treatment for catarrh for two or three months, we wait no longer, but boldly operate with a shield, the results have justified this practice, for I cannot recollect the loss of an eye which could be attributed thereto.

I think every eye should be inspected within the first 48 hours, though after this, if all goes well, I now only open the eye once in three days.

A good deal has been written about Aigylol it is said not to be an antiseptic. I am not prepared to argue the matter on bacteriological grounds, and I am aware that I am speaking largely on empirical grounds, but there is no doubt, whatever, in my mind that this drug is invaluable for controlling the minor conjunctival inflammations to which the eye is liable after extraction. Even in cases of suppurative keratitis and iritis I have seen the most admirable results follow the use of a 25 per cent solution of Aigylol. Protargol is often of use, but has this drawback that patients squeeze the eye from the pain of the instillation, which is often most undesirable.

SOME POINTS IN THE AFTER-TREATMENT OF CATARACT OPERATION CASES

The use of sub-conjunctival injections has become very popular during the last few years. In this hospital we have given them a free trial, and have now dropped injections of sterilised air, or of chemical solutions, and confined ourselves strictly to the use of normal saline solution. The method in use has been already demonstrated to you, if it is followed, sepsis is practically impossible, and we never see the least harm from it. Patients complain of but little pain and in the two classes of cases in which we use these injections most largely, viz., for iritis, and for retained cortical masses, the results have been all we could desire. Most of the iritis cases are, of course, in other than cataract patients, but four of them were post-

operative and in every one of them the influence of the injections was well marked. The iris clears, the pupil dilates and the circumcorneal zone disappears under the use of injections. As for masses of cortex, it undoubtedly hastens their disappearance, and at the same time allows the pupil to dilate under the influence of atropine. It is, of course, very difficult to correctly appraise the influence of any measure in hastening the resorption of cortex, but we have multiplied the experiment so often (having used sub-conjunctival injections 45 times during the last year for this purpose alone), that there can be, and is no doubt in any of our minds on the subject. The injections are repeated twice a week till the pupil is clear.

Dionin has been advocated as a drug which by its lymphagogue action is of service in clearing up corneal opacities, and in promoting the absorption of left cortex. For these purposes some use it quite early in the after-treatment of cataract. I have burnt my fingers more than once by making trial of methods which have been lauded on the strength of a few cases, and rightly or wrongly I fear that the use of *Dionin* under the circumstances mentioned above may not be free from danger. When the wound is soundly healed and the eye looks normal ten days or more after the extraction, we have used *Dionin* with good results to aid in the absorption of cortex or the resorption of corneal opacities.

ON A RARE FORM OF CORNEAL OPACITY

There is a form of corneal opacity met with after extraction, which I do not remember to have seen described anywhere. We have been watching very carefully for it of late years, and have noted its appearance and behaviour on each occasion. The leucoma is frequently ring shaped, though the ring may be very irregular, more rarely it assumes the form of a round patch fading away at the edge, it clearly lies on the deeper surface of the cornea, or at least is most intense there, it is frequently situated in the neighbourhood of the section, though it is occasionally met with far away therefrom, rarely there may be two or even three such spots. A careful examination with a corneal loupe never fails to show the cause of the phenomenon, a fine tag of capsule is seen running up to and attached to the back of the cornea opposite the densest part of the opacity. Moreover, such opacities are commonly associated with a delay in the healing of the section. The latter point is of much interest, as it may place in our hands a ready means of bringing about closure of the chamber in obstinate cases which have defied all our efforts. If the capsule tag can be seen, it is seized with forceps and torn, when the section at once heals. Of course, there are much more common causes of unhealed section than this, viz., a poor state of

the patient's nutrition and interference with the eye on the part of the patient.

ON PRELIMINARY IRIDECTOMY AND ON OPERATIONS FOR THE MATURATION OF CATARACT

If there is one subject on which I have become more convinced than on any other, it is the utility of *iridectomy* as a routine stage of extraction. There is perhaps no operation more easy to the experienced eye surgeon, or more difficult to the tyro than the performance of a neat *iridectomy*. If well performed under aseptic conditions, the procedure is practically free of risk. I do not believe that in competent hands it adds very appreciably to the dangers of the operation for cataract when performed at the time, whereas when performed as a preliminary operation experience has shown us that it may be considered practically free from risk. These considerations have led me to perform *iridectomy* in a large number of immature cataracts before sending them back to wait for maturity. Nor is this all. From time to time, we see in this hospital a batch of cases come in, suffering from glaucoma, secondary to cataract. The swelling lens has at last pressed on the channels of outflow, and determined a rise of intra-ocular pressure. It is of interest to record that these cases often occur in batches, suggesting that some climatic influence has been instrumental in bringing about the increase of tension, presumably by playing on the vaso-motor mechanism and altering the blood-pressure. The reality of this danger may be understood from the fact that we have met with cases of glaucoma, secondary to cataract in the past year. By performing an *iridectomy* in all cases of immature cataract, it seems likely one would be able to lessen if not remove the danger of this complication. It is not a matter which lends itself easily to comparative statistics, but the consideration of the figures before us bears out this supposition. In any case we rob the final operation of one stage.

When a patient presents himself with immature cataract in two eyes, we perform an *iridectomy* on the eye with the better sight, and a Forster's operation on the other. After trying various methods for artificial maturation of cataract, Forster's alone appears to us to be worthy of further trial. It is unfortunately a little uncertain, sometimes it leads to maturation so rapid as to enable an extraction to take place within a month, whilst at other times, it requires several repetitions, or may even be practically a failure. So far it has not been possible to ascertain to which class of cataracts the method is most suitable, but it is hoped that this may be done in time. The advantage of being able to cut one or two years of helpless blindness is very attractive, and many of the cases have been most encouraging, but it must be squarely faced that the procedure is not without an added risk, though not a very large

one We have been carefully collecting statistics, and it is hoped to publish the result in full later

CYANOPSIA AFTER CATARACT EXTRACTION

Over 50 per cent of our patients complain of cyanopsia after extraction has been performed. The complaint was only a matter of a few days. In a series of 250 only 2.8 per cent complained of erythropsia, and 1.2 per cent of yellow or green vision. It would appear that post-operation cyanopsia is commoner in India than in Europe. Nearly every leading text-book lays stress on erythropsia after extraction, but I cannot find that a single one even mentions cyanopsia. The explanation offered for the blue vision is that the retina has been long exposed to yellow rays passing through a lens of that colour, and that for this reason it suffers from yellow-fatigue for a time after the predominant tint has been removed, with the result that the complementary colour is strongly before the patient's vision. There are unfortunately many points this explanation will not cover, e.g., the fact that quite a large percentage of the cyanopsia patients see everything white at first and only develop the blue vision after some hours or days. Many series of observations were undertaken with a view to ascertain whether the depth of colour of the lens determined the degree or persistence of cyanopsia, even sensitive photographic paper was requisitioned to determine the relative yellow and red stopping power of the various lenses. Unfortunately it is not an easy subject for experiment, and so far our results have been negative.

THE RECOGNITION OF THE PHYSICAL CHARACTER OF A CATARACT BEFORE EXTRACTION

During the past four years a great deal of trouble has been taken to study the appearances of cataractous lenses before operation and to compare these observations with the physical properties of the same lenses after extraction. As a result, we have been able to define a certain number of classes of lens, and we can in many instances foretell with confidence the class of lens we are going to meet with and the special treatment it will require for its complete extraction. At the present time we are making a systematic effort to render this classification more reliable, and more precise. It may be possible to demonstrate the various classes to the branch at no very distant date.

I am very conscious that this paper is scrappy, and that it has only touched the fringe of a large subject. My motive from the commencement was not to deal exhaustively with so immense a thesis as that of cataract extraction, on which books might easily be written, but to show, in some measure, how interesting and complicated a study is presented by this small branch of surgery, and how erroneous is the

widespread belief expressed in the words with which I opened my paper, *viz*, that "any one can take out a cataract."

PS—Dated 20th Feb 1908. One thousand consecutive cases have now been operated on for cataract after treatment by the combined method of cleaning the conjunctival sac. In this series there has been only one case of suppuration of the eyeball (alluded to in the text). 691 consecutive cases of extraction have now been performed (since the one case of panophthalmitis) without a failure.

SOME OBSERVATIONS ON THE USES OF THE OPERATION OF APPENDICOSTOMY

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DURING the last two years endeavours have been made in the Rangoon Hospital to give a fair trial to the operation of appendicostomy as an aid in the treatment of chronic ulcerative conditions of the large bowel. The patients chosen have been those in whom, so far as could be judged, the ordinary medicinal treatment held out no reasonable prospect of recovery, so that any success gained has been credited rightly or wrongly to the operation.

Broadly speaking, the cases have come within three classes—

(1) Wasted debilitated patients generally brought to hospital by the police, after having been deposited in the streets by their wearied friends and relatives.

(2) The chronic dysentery cases who have been correctly treated either outside or in hospital and are in a fairly good state of nutrition but in whom prolonged medicinal measures have failed to bring about a cure.

(3) Cases of acute fulminating dysentery in whom very serious symptoms, attributable to the bowel ulceration, have arisen early in the course of the disease.

In all, some 30 cases have been operated on. The greater number of these cases have come from the first class of patients, and perhaps a word concerning the usual pathological conditions found in this type of case may not be amiss.

The general condition of the patient is that of starvation, and his great craving is for solid food, his tongue is clean and signs of disease in the chief vital organs are absent. The abdomen is sunken and the only evidence of disease is some tenderness along the course of the large bowel (the bowel being frequently obviously thickened) and the presence of diarrhoea. The motions are very frequent, 15 to 20 in the 24

hous, they are passed generally without pain and more usually than not into the bedding, in character they are fairly typical, very small in quantity and consisting almost entirely of thick mucus mixed with blood. Such cases with us rarely recover; their vitality is so lowered that all powers of repair seem to be destroyed, and they die a troublesome, lingering death. With the exception of the general extreme wasting—*e.g.*, the heart often weighs from 4 to 5 ounces only, the *post-mortem* pathological changes are limited to the large bowel, this is in a condition of what might be termed "hyperplastic ulceration" from end to end, the whole of the mucous membrane being replaced by an ulcerated surface roughened and thickened, the remains of the mucous membrane often hanging as it were in "rags and tatters", a condition quite different from the usual dysenteric ulcerations which are definite discrete ulcers often involving large areas but always mingled with what looks like fairly healthy mucous membrane. In fact, the condition of the bowel in these starvation cases seems to correspond with that described by Kaufmann in cases of "Pilgrim diarrhoea". Such cases are most commonly seen soon after the beginning of the rainy season.

Of the 2nd class of case little need be said. The clinical and pathological features of such cases are familiar to all who come in contact with tropical diseases. They are not as common among our hospital patients as might be expected considering the frequency of acute dysentery, but at the end of the rainy season and for a couple of months afterwards the wards are rarely free from a few cases.

Of the 3rd class, cases are fortunately few, in these cases the great difficulty lies in the early accurate diagnosis.

In the cases which have come under our notice operative interference was apparently delayed until too late.

The operation of appendicostomy is so simple and has been described so frequently that a full description of the procedure is superfluous, but there are one or two points of some practical importance that are worthy of mention.

I.—In the majority of cases the operation can be done readily under a local anæsthetic, and in debilitated, weak patients such a procedure should be invariably adopted to begin with. If unexpected difficulties arise, a general anæsthetic can be resorted to later.

II.—The length of the primary skin incision should be limited to what is necessary, in order to introduce one finger and a pair of sequester forceps into the abdomen. Through such an incision (an incision a little less than $1\frac{1}{2}$ inches in length) the appendix in an emaciated person can readily be found and brought to the surface, provided that the appendix be of average development and the region free from disease. If the incision be small, there is less risk both of wound suppuration and post-operation hernia.

III.—In seeking for the appendix touch rather than sight should be relied upon, and the search may be facilitated by running into the abdominal cavity a certain amount of warm sterile saline solution, and so floating away the freely movable and hampering small bowel leaving alone in the area in which the search is being prosecuted the more firmly attached cæcum with its appendix. The difficulty that most frequently arises in the endeavour to identify the appendix by touch alone is the presence of slightly enlarged and firm glands around the cæcum, these roll under the finger and often have a smooth rounded feeling, exactly similar to that of the appendix tip.

This search by touch should not be unduly prolonged, five minutes is the limit we have usually adopted. If at the end of this time the appendix has not been located, the incision should be prolonged with scissors and further search assisted by actual vision.

IV.—After the appendix has been brought out through the abdominal wound, some straightening is usually required, this is readily accomplished by a few snips in the appendix mesentery. For fear of gangrene of the appendix a warning is generally given, to preserve intact the artery running along the edge of the appendix mesentery, we have always disregarded this warning and have seen no ill results, save in one case where probably the cutting of the artery served only as an auxiliary to the subsequent gangrene. However, if the appendix artery has to be cut, it is as well to take care that when the appendix is fixed into position, the point at which the artery is cut will lie outside the peritoneal cavity, this for two reasons, 1st, in order that should the catgut ligature slip from the artery there may be no danger of the hæmorrhage being internal, 2ndly, that if gangrene of the upper portion of the appendix should occur, the gangrene may stop short outside the peritoneal cavity.

V.—In fixing the appendix, no long pedicle, formed by the intra-peritoneal portion of the appendix, should be left, *i.e.*, the appendix should be fixed to the peritoneal wall fairly close to the origin of the appendix from the cæcum.

VI.—The peritoneal incision should, as a rule, be closed carefully and apart from the skin incision, as should suppuration take place in the wound, this careful closure of the peritoneum is some safeguard against the infection of the general peritoneal cavity, and it is to be remembered that many of the cases suitable for this operation have skins ill adapted for the attainment of surgical cleanliness, and a condition of vitality probably not very resistant to pyogenic infection.

The usual practice seems to be to leave the appendix unopened for from three or four days, the advantages of such delay hardly seem to compensate for the loss of treatment over such a period, and our general practice has been to open

the appendix at the time of operation and pass down a fairly fine soft catheter or bougie, this is left *in situ* and after 8 or 12 hours there is absolutely no difficulty in introducing the larger catheter to be used for the irrigations.

We have used many different irrigation fluids, but upon the whole Izal of a strength one to three drachms to a pint of warm water has been the most satisfactory. After the wash through with two to three pints of such fluid we have tried the introduction of small quantities of various oily and emollient substances in the hope of such acting as a sort of dressing to the cleaned ulcerated surfaces. It is difficult to judge the efficacy of such attempts, but we have thought that the introduction in this way of about four ounces of glycerine was of some benefit. The irrigation of the bowel is carried out twice in the 24 hours and is simplicity itself.

With regard to the results achieved. Of the cases of the first type we have had only one recovery, and even when he left the hospital for his own country was in poor health. One other such case lived five weeks and was entirely relieved from his diarrhoea, but never regained strength and died from general debility in an advanced state of emaciation. *Post mortem* the condition of his large bowel was very interesting, active ulceration appeared to have been cured, but the mucous membrane of the entire large bowel was replaced by a layer of smooth shiny material which on microscopical examination was found to consist of young fibrous tissue. Such a condition has been once again observed in the *post-mortem* room, in a case that died of tuberculosis. Apparently this latter case was one who had at some previous period suffered from "ulcerative colitis" which had become cured under native treatment, so that occasional nature cure would appear to be not impossible.

Of the 2nd class of case we have a much more encouraging record, six cases being returned as cured out of some ten cases operated upon, and it is for this class of case that the operation appears to promise a most encouraging future. This of course is not a high percentage of recovery, but it must be remembered that appendicostomy was only performed when all other treatment had failed and the patients were steadily losing strength and condition.

Of the 3rd class in only four cases has operation been attempted and all died, but they were desperate cases and the operation too long delayed, one at the time of operation being found to have peritonitis from perforated dysenteric ulcers and another bleeding profusely from the large bowel, was unconscious and in a grave state of general toxæmia. Upon *post-mortem* examination in this case the mucous membrane of the bowel was found to be actually gangrenous. So much for final results they are not at first sight encouraging except in cases of true chronic dysentery who were in a fair state of nutrition and in whom it may be urged that

recovery under prolonged medical treatment was possible. However, in estimating the utility of the operation, it must be borne in mind that only the more obstinate cases have been selected for operation, and it has been the unanimous opinion of all who have had to do with the cases, that the recoveries have been at all events greatly accelerated by the operative measures adopted. Moreover, we are of opinion that the utility of this measure is not fully gauged by the actual final results achieved. Of all measures tried the thorough lavage and emptying of the large intestine, possibly by the help of this operation, has stood out prominently as most efficient in lessening the patients' distressing diarrhoea. In addition, in one case very severe intestinal hæmorrhage was brought under control only by means of strong solutions of hazelme, introduced through the appendix opening, after all the ordinary medical remedies had failed.

The knowledge that the large bowel is being efficiently flushed and emptied twice in the 24 hours gives much greater courage to the medical attendant in allowing a fairly liberal diet and in the free use of opium.

With regard to possible objections to the operation, the two main ones that are raised are 1st, that the condition of the patient is such that an operation involving a certain amount of shock is inadvisable, and 2ndly, that the operation itself is dangerous.

With regard to shock, if the operator can perform the operation quickly, under a local anæsthetic, through a small incision, and without exposure of the abdominal viscera, then shock is entirely absent. That these conditions can be fulfilled in the majority of instances by an operator of average skill and experience we are confident. In a few cases a more extensive operation may be found necessary, in such cases the operator can proceed to a general anæsthetic and further search, or desist, according as the condition of the patient seems to warrant.

The danger of the operation itself, if the operation be performed under suitable conditions, cannot be represented as great. The most obvious danger is septic infection of the general abdominal cavity, unless an operator from his previous results and experiences feels confident that this can be discounted as very highly improbable, he had certainly better trust to medicinal measures. Of the other dangers attended upon the operation, we have had two cases which serve as warnings. In one case owing to a more than usually thorough closure of the peritoneal wound, the appendix was partially strangled in the suturing and gangrene resulted and finally perforated into the general peritoneal cavity.

In a 2nd case death was due to a sub-acute intestinal obstruction caused by a piece of omentum adherent to the wound, forming a band and tightly binding down a coil of small bowel which had gradually become obstructed.

These are the only two cases which we have to record where death was in any way due to the operation, and in both the accidents were such as probably will not recur. In three other cases the operation was impracticable in two owing to the lumen of the appendix being obliterated, and in the 3rd case, to the impossibility of finding the appendix even after a thorough exploration. The fact that after cutting off the distal portion of the appendix the lumen may be found obliterated is an argument in favour of completing the operation in one stage, as if it is thought advisable a cæcosotomy could then be very readily prepared for by bringing a portion of the cæcum, as well as the appendix, outside the abdominal wall.

As far as appendicostomy is concerned, there is no danger of fecal fistula, in fact, the difficulty is to keep the lumen of the appendix patent.

In conclusion, we would argue that the operation provides the most efficient means for thoroughly washing out the large bowel without undue distension or discomfort, that when once the operation has been performed, the further treatment of the case can be left with full confidence to very unskilful assistants, that in practically all cases great relief is afforded to the patient and in many actual cure is either brought about or greatly accelerated, that the dangers and difficulties of the operation are not such as can counterbalance the advantages that may be reasonably expected in suitable cases. But we would also insist that the procedure is no panacea for all ills of the large bowel and should only be adopted after careful judgment and after a fair and proper trial of the other more usual and perhaps less attractive medicinal measures, employed with such discrimination and its advantages recognised with a just appreciation, we feel confident that the future will see a steady increase in the use that is made of this simple operative measure, at present too little known and practised although in tropical countries at any rate occasions for its proper use are no means rare.

KALA-AZAR IN PATNA

By B. B. BOSU,

Teacher, Temple Medical School, Patna

It is a well-known fact amongst the people here that when one is attacked with enlarged spleen recovery is rare. When working in the Outpatient department of the Bankipore General Hospital, I was struck with the great dread which the patients had of enlarged spleens.

Since 1905, when the identity of kala-azar as a separate disease was clearly established, and its association with Leishman-Donovan bodies in the spleen became well known, I began to examine the blood of some of the cases of enlarged spleen in the Bankipore General Hospital obtained by spleen puncture, and in most

of them I have found Leishman Donovan bodies in abundance. In a few such cases I found only malaria parasites both in spleen and peripheral blood, but curiously, so far, I have not come across any case with both infections together, which is probably rare.

I have notes of 28 cases of kala-azar treated at the Bankipore General Hospital. These were all indigenous cases, most of them have never been away from the district from which they come. Out of 28 cases, 17 came from Patna district and the rest were from the neighbouring districts of Gaya, Muzaffarpur, Saran and Monghyr.

The clinical features on the whole tally in most respects with those described in cases elsewhere. Enormous enlargement of the spleen with emaciation and irregular fever are the prominent features.

Age—A striking feature about these cases is the remarkable prevalence of the disease amongst children and young adults. There was only one case in the present series who is above 40 years, while most of the cases are in persons between 15 and 25 years of age.

Emaciation is frequent although not constant.

Enlargement of spleen is always present, frequently causing a distinct bulging over the left side of the abdomen.

Enlargement of liver is present in most cases, but is not a very prominent feature of the cases. In most cases the enlargement was only slight. Marked jaundice was present in two cases, one case died with symptoms of cholæmia. In two cases upward enlargement of the liver, with dry pleuritic friction at the base of the right lung, led to the suspicion of liver abscess, both were explored without any pus being found. One of these cases died later, and at the post-mortem, the liver was found greatly enlarged upwards, but there was no abscess.

Abdominal symptoms—Diarrhoea and dysentery come on late in the disease, but in some cases diarrhoea was met with earlier.

Ascites was rare and was met with in two cases only.

Fever is frequently present but may disappear for a short time. The temperature charts show at times intermittent, at other times low remittent types of pyrexia.

Cutaneous symptoms are often absent. They were absent in 17 out of 28 cases. In five cases there were pimples over the leg or elsewhere on the body. In six cases there were chronic ulcers on the lower extremities. Purpuric spots were common towards the end.

Dropsy is a late symptom. It was present in only five cases out of 28.

Albuminuria was present in three cases. The amount being merely a trace.

Pleurisy was present in two cases. In one case there was also cough and expectoration. No tubercle bacilli could be detected in the sputum.

Epistaxis was noticed in only one case, although history of previous attacks was not rare.

Risk of spleen puncture—Spleen puncture is no doubt accompanied with some amount of risk. In suitable cases there is no risk, provided the patient is kept in bed for 24 hours after the operation. It is better to keep him on low liquid diet for the next 24 hours and to fix the spleen by an abdominal binder below it, before puncturing. The larger the spleen, the less the risk. Cases with ascites, or even those with marked general dropsy, are unsuitable for spleen puncture.

Results of treatment—The cases were treated with Syrup of the Iodide of Iron and Cod Liver Oil, with the idea of improving their general health, but so far without any encouraging results. The cases slowly go from bad to worse till finally they get diarrhoea, after which they generally die of asthenia or some intercurrent disease.

LARGE MULTILOCULAR CYST OF THE NECK IN AN INFANT

By C. F. SCHAFFTER,

Civil Surgeon, Jalna

THE following notes on this comparatively rare case may, I think, prove interesting and worthy of record—

On the 30th of last January a Malhatta "Coonbie" (farmer) belonging to a neighbouring village, came to Hospital with his wife, for the treatment of their infant son, Rajaram, (aged 3 months). The child had an enormous tumour on the left side of its neck, involving the left cheek, and extending in front across the median line of the neck. The upper margin of it was pushing the whole ear upwards and backwards, so that it appeared as if the ear were riding on the top of the tumour. The lower margin was resting on the left shoulder and upper portion of the chest. The whole mass was freely moveable, somewhat hard in the centre and fluctuating all round. The skin was tightly stretched over it, but not reddened or shiny. Pressure on the mass did not seem to produce any pain, but increased the dyspnoea and dysphagia, two main symptoms the little fellow was suffering from most.

Previous History—The mother stated that at birth she noticed a very small swelling just below the angle of the jaw and this had gone on increasing in size. It did not seem to trouble the child, but lately it had begun to interfere with its breathing and swallowing, and this had compelled them to seek for treatment.

Diagnosis and Treatment—I, at first, thought it was a large blood cyst, due probably to rough handling at birth and tapping it with a fine trocar and canula, drew off a small quantity of

dark red blood, which seemed to confirm my diagnosis. On shewing the case to a Medical missionary here, he, too, was of the same opinion.

I, therefore, decided to lay open the cyst, search for and tie the ruptured vessel, the probable cause of this effusion or stuff the cavity with strips of lint, soaked in Tinct. Ferr. Perchloride. This I proceeded to do the next day. Owing to the difficulty of breathing the baby was suffering from, chloroform had to be dispensed with. A one inch incision was made, about the middle of the lower part of the tumour. There was a gush of blood, which soon stopped, revealing the smooth shining walls of a cystic cavity. But this escape of fluid did not seem to reduce very much the size of the tumour. On tapping in several places the rest of the tumour, about 3 ounces of clear serous fluid (not blood as in the first instance) was drawn off. It only then dawned on me that it was a multilocular cyst I was dealing with. This considerably reduced the swelling and instantly relieved all urgent symptoms.

I would very much have liked to have dissected and shelled out the whole mass, but the age and the general physique of the patient was against my doing so. The wound was therefore dressed antiseptically every morning and every other day or so I injected the swelling (or rather what remained of it) in two or three places with a few drops of glycerinated solution of Iodine (strength 5 to 1) and also painted it twice, externally, with Tinct. Iodine. This reduced the swelling still further, and I was in hopes it would eventually shrivel up and finally disappear. No symptoms of Iodism were produced. But to my great disappointment, on my arrival at hospital one morning, the 9th day after operation, I was surprised to learn that the child had suddenly died, just a few minutes before I came in.

The mother on being questioned about it stated that the child had slept well through the night, but was breathing very stertorously towards morning. About four days after the operation, the child appeared very drowsy and listless, and on enquiry I discovered the mother was in the habit of giving the child opium, which, on this occasion, she had evidently carried to excess. I warned her against this practice, but I feel almost sure that my advice was not followed, and this was probably the cause of its death.

It was a disappointing termination to an interesting case.



Indian Medical Gazette

JUNE, 1908

THE BOMBAY MEDICAL CONGRESS

THE proceedings of the third meeting of the Central Committee was held on 28th April. Several extra representatives were invited to join the Central Committee, including the Sanitary Commissioner, Bombay, and representatives of the two classes of Assistant Surgeons. Mr. White, the representative of the well-known firm of Messrs. Burgoyne and Burbridge, offered his services in assisting to organise the Exhibition which, it is hoped, will be a feature of the Congress. The important subject of Funds was then discussed and a sub-committee appointed to collect contributions from public bodies, medical men and private individuals.

An application for such contributions will soon be circulated to medical men in India, and it is to be remembered that any money left over will be devoted to the medical charities. All medical donors of not less than ten rupees will become unconditionally entitled to admission cards, and donors of 15 rupees and over will, in addition, have their names registered for a free copy of the *Transactions* of the Congress when published.* The larger the sum the Committee has at its disposal the more comprehensive and far-reaching will it be able to make the undertaking.

In certain cases medical men well known for their work in certain diseases will be invited to contribute papers, and in such cases the out-of-pocket expenses will be defrayed by the Committee.

The following gives the preliminary programme as at present arranged—

The Congress will be divided into six sections, viz—

SECTION I—

Cholera	First day
Dysentery	Second day
Enteric Fever	Third day
Tropical Diarrhoeas	Fourth day

* Fifteen rupees is a minimum for joining and for copy of *Transactions*. We suggest that all I. M. S., and R. A. M. O. officers should subscribe Rs. 20 each. All cheques for subscriptions should be crossed and made payable to the General Secretary, Bombay Medical Congress, and addressed to him c/o Messrs. King, King & Co., Bombay—ED.

SECTION II—

Malarial Fever	First day
Plague	Second day
Leishman Donovan Invasion	Third day
Relapsing Fever	Fourth day

SECTION III—

Parasitic Insects	First day
Snake Venom	Second day
Beriberi	Third day
Mycetoma, Leprosy and Elephantiasis	Fourth day

SECTION IV—

Sewage disposal in India	First day
Water supplies	Second day
Disinfection (and method of destroying vermin, etc.)	Third day
Miscellaneous papers on sanitation	Fourth day

SECTION V—

Ophthalmic Surgery	First day
Vesical and Renal Calculi	Second day
Miscellaneous	Third day

SECTION VI—

Exhibitions	All days
Lantern Slide Demonstrations	Second night

The above programme is an attractive one, and should meet the wishes of all medical men in India.

Current Topics.

DIAGNOSIS AND PROGNOSIS IN KALA AZAR,

At a meeting of the *Society of Tropical Medicine and Hygiene*, held in London on 21st February, there was a very interesting discussion on the prognosis and treatment of infection by the Leishman-Donovan bodies, or Kala-Azar. In the first place, Fleet Surgeon Bassett-Smith, R.N., described four cases, which are of special importance as showing the widespread prevalence of this terrible disease. One of the Navy cases "contracted the illness in S. Africa," the second was originally a merchant seaman and "had been much to India." The third case was a stoker, and the disease commenced in S. Africa. In the fourth instance the sailor had served on the East and West Coasts of Africa and had "lived on shore in Bombay and Timconalee," he had also been to China and Siam, the illness did not apparently begin till he reached England.

Sir P. Manson also read notes of a case of recovery from this infection in the person of a Missionary who had lived for many years in Nadia District, Bengal. The points in this case were, first, a chronic febrile illness lasting one year, followed by great improvement, which lasted for 15 months, and then a severe relapse with great aggravation of the symptoms, and,

finally, apparent complete recovery. Sir Havelock Charles, in discussing the question, referred to a case of his own in a high caste Hindu ["a native of the Behais" (*sic*)] who was cured by continued sea-voyages between Colombo and Australia. Lt-Col Leishman, R.A.M.C., took a very serious view of the prognosis in this disease, and had never seen any good results from the sea-voyage in cases of this disease among soldiers invalided from India.

He looked upon the atoxyl treatment with great hope and referred to a method for finding the parasites in the peripheral blood, suggested to him by Major Cummings, R.A.M.C., *viz*, to obtain pustulation by an irritant applied to the skin, so that a collection of polynuclears could be thus obtained. Dr Low referred to a very interesting case where the Leishman-Donovan parasites were not found, but *post-mortem* there were adenomata of the suprarenal bodies, but no evidence of Addison's disease, a case which may be contrasted with that of Banti's disease by Major Donovan, I.M.S., which we publish in this issue (p 231). Dr F. W. Sandwith referred especially to the danger of spleen puncture for diagnostic purposes, saying that he had himself seen many times accidents occur from this method. We refer our readers to p 232 of this issue, where we have collected the opinions of the medical officers of the Madras General Hospital on this fell disease.

TYPHUS FEVER AND ALLIED DISEASES

THE interesting papers by Capt J. Husband, I.M.S., and Capt R. C. MacWatters, I.M.S., and by Capt E. C. Hepper, I.M.S., which we publish in this issue, serve a useful purpose in reminding us that typhus fever is still to be reckoned one of the continued fevers of India.

There are many points of interest in these papers, but we propose only to refer to one or two. In the first place, typhus fever has ceased in England to be regarded as a disease of importance, and the ordinary practitioner knows as little of it as most of us did of plague a dozen years ago. In Edinburgh and Dublin, however, cases are not uncommon even in these sanitary days. As a consequence of its rarity but little has been done in investigating the etiology of this once formidable epidemic fever, *eg*, Sir John W. Moore of Dublin, in his splendid article in Allbutt's *System* (Vol 2, Pt I, p 538) has but little to say of the bacteriology of the disease. In Allbutt's next volume (Vol 2, Pt II, p 310) Dr L. W. Sambon (characteristically) plumps for the identity of typhus with the "spotted fever of the Rocky Mountains," an attitude we cannot support when the different etiology and the very different clinical history are considered.*

There is, too, another analogous or allied disease named variously "tsutsugamushi disease," "shimamushi" or the "Japanese river fever," which has many points in common with both typhus and the "spotted fever" of the Rockies. The non-identity, however, of this spotted fever with the Japanese river fever has been recently, we think, established by the excellent monograph published by Drs P. M. Ashburn, and C. F. Craig (*Philippine Journal of Science*, vol III, January 1908, p 1, etc.). The resemblances are many, as also are the differences.

The authors of the papers we publish, however, make one very important statement which cannot be passed over in silence, *viz*, that typhus fever is identical with the serious type of pneumonia, well-known to all who have served on the N.-W. Frontier as "Frontier" or "epidemic" pneumonia.

In former days one heard much more of this disease, and indeed recently we have published some references to it, *eg*, in August 1905, (*I. M. G.*, p 289), Capt F. Norman White, M.B., I.M.S., published a valuable paper on two cases of septicæmic pneumonia (due to the pneumococcus of Frænkel), in which he pointed out how this "Frontier pneumonia" differed from the European type of the disease and how it attacked healthy men in the prime of life, and last year (April 1907, *I. M. G.*, p 131) Capt J. Hay Burgess, I.M.S., I.R.C.S., referred to an epidemic on the Malakand, in which in a couple of months there were 24 cases with no less than 10 deaths (a very high case mortality for ordinary croupous pneumonia).

Below we give an account of epidemic Frontier pneumonia as seen by Dr Andrew Duncan in his service on the Frontier.

THE EPIDEMIC PNEUMONIA OF THE N.-W. FRONTIER

IN the above column we have alluded to the question of the nature of this well-known and formidable disease of the North-West Frontier of India.

In reading an admirable little book on *Sick Nursing in the Tropics** by Dr Andrew Duncan, M.D., I.R.C.S. (Physician to the Seamen's Hospital, London, and formerly a Surgeon-Major, I.M.S.), we have come across a good description of this frontier type of pneumonia (which Captain Husband and Captain MacWatters, I.M.S., in their article in this issue claim to be typhus).

Dr Duncan writes—"Personally I have found pneumonia one of the most frequent diseases met with in hospitals in India after bowel complaints and malaria," an opinion which will be shared by many, for there is no doubt of the considerable prevalence of this complaint in

* Cf. Murchison's classical description of typhus written when the disease was common with the description of spotted fever as given in Stiles or Chowning or in the text books of tropical diseases.

* A Guide to Sick Nursing in the Tropics, by Andrew Duncan, M.D., etc. London, The Scientific Press, December, 1905. Price 2s 6d net.

Northern India Dr Duncan points out that on the North-West Frontier pneumonia "occurs in epidemics," and he gives an account of an epidemic which fell under his personal observation which we here abstract —

Dr Duncan in November 1885 joined the 23rd Pioneers on their return from the Pishin Valley, where they had been engaged for some months previous in making the Hunai Railway. "The regiment reached Amballa on 25th November, and all that cold weather cases were constantly coming into hospital with pneumonia. Various theories to explain this were put forward. The regiment was and had been well and comfortably clothed, the sick rate before return to Amballa had been low, it was not due to the cold of Amballa as it continued after the cold weather had passed away, and notwithstanding the onset of the hot weather. The lines were then evacuated, disinfected, ventilated and left empty for three days and the only cases which followed were such as could be accounted for by the period of incubation of the disease."

A reference to Tables XXVI and XL in the Annual Report of the Sanitary Commissioner with the Government of India (we take the 1905 report as being at hand) will show the increased prevalence of cases returned as pneumonia in the native army and among the prisoners in the Punjab and N-W Frontier as compared with the rest of India (per mille of average strength)

	Northern Command		Western Command	Eastern Command	Secunder Division	Burma Division	Army of India
Pneumonia in Native army	20 per mille		11	9	5	3	12

	Burma	B & A	Bengal	U P	Punjab	N W Prov	C P	Madras	Bombay	All India
Pneumonia in Jails	3	8	6	12	14	13	9	8	13	9

Nowadays that pneumonia is recognised to be a specific infectious disease, characterized by an inflammation of the lung, it is increasingly recognised that the disease is communicable and its spread is fostered rather by impure air and over-crowding than by chills. It is, however, not always easy to separate the effects of close air and chills, because in cold climates there is a greater tendency to stop up ventilation openings and windows to keep out the cold. The endemic presence of influenza in all parts of India, with its exacerbations at the changes of the seasons, is another factor which makes difficult the study of the statistics of pneumonia in different parts of India.

We shall welcome any information which medical officers have on this important disease

and especially with regard to the form known as Frontier pneumonia

MR W M HAFKINE ON PLAGUE

We have received a copy of Mr Haffkine's interesting paper read before the Royal Society of Medicine, London, in January 1908. Mr Haffkine discusses the various methods of a plague campaign, comprising discovery, notification, isolation, segregation of contacts, quarantine and the examination of travellers. He points out that the part played by man in the spread of plague is on the whole subordinate to that of other agents. He states that plague is in a general sense a disease of locality, it is contracted principally at night. Mr Haffkine from his long experience recognises that the necessary precautions can rarely be carried out thoroughly. He writes —

"This is due to the impossibility of enlisting the self sacrificing co operation of individuals to the first cases being rarely recognised, to the reluctance of those falling ill to deliver themselves into the hands of strangers and officials, to the measures of prevention hurting trade and numerous private interests, and to the consequent wholesale evasion of prescribed rules. The time, therefore, arrives when the measures directed against man are relaxed or dropped, and efforts are chiefly applied to inanimate objects."

As regards the impracticable suggestion for the disinfection of merchandise, Mr Haffkine has the following sensible remarks —

"The enormous bulk of merchandise conveyed nowadays by rail and ship admits of no process which would answer to elementary requirements of disinfection, and the opposition and hostility of vast numbers of people, whose interests are interfered with by these measures, can only be estimated when the task is actually undertaken."

He then enumerates the measures relating to the lower animals—measures which have "for their object, and I believe rightly, the rat and the flea."

We are surprised to find a reference to the beginning of plague in Calcutta in 1896. Surely, Mr Haffkine does not believe in Dr Simpson's plague scare of the autumn of 1896 in Calcutta? On the subject of inoculation Mr Haffkine's opinion is of course of the greatest value, and we quote the following statements —

(1) That in a native of that country, who is more susceptible to the disease than Africans, Europeans and some other races, the inoculation now in force in India reduces the liability to attack to less than one third of what it is in a non inoculated Indian.

(2) That in the one third of cases which still occur, the recovery rate is at least double that in the non inoculated attacked, the ultimate result being a reduction of the plague mortality by some 85 per cent of what it is in non inoculated Indians.

(3) That in an inoculated European an attack of plague, if it subsequently occurs, has so far always ended in recovery.

(4) That the inoculation is applicable to persons already infected and incubating the plague, and prevents the appearance of symptoms, or else mitigates the attack, a fact which discloses a basis for the bacterio-therapeutic treatment of disease.

(5) That in natives of India the degree of immunity conferred by this inoculation though gradually vanishing, seems to last during several outbreaks of plague, and that

(6) In Europeans the effect has not yet been seen to disappear in the space of time, since 1897, that this inoculation has been under study.

The whole lecture is of great interest and should be read by all interested in plague problems.

THE PASTEUR INSTITUTE OF SOUTHERN INDIA

WE have received the first report (for the period ending 29th February 1908) of the Pasteur Institute of Southern India, which was opened on 1st April 1907.

The report of the Director, Major Cornwall, I.M.S., M.D., contains much that is of interest. The virus was supplied by the Kasauli Institute, and was originally derived from the Paris Institute, and is now at Coonoor at its 229th passage. In the first period of working (up to 29th February 1908) the Institute has treated no less than 186 patients, of these 8 remained under treatment at end of the period, one developed hydrophobia on the seventh day after his too late arrival, and four for various reasons did not complete the treatment. Experience has shown that immunity is not thoroughly established until at least 14 days have expired *after* the completion of the course of treatment, and cases therefore which may develop hydrophobia during the course of or within 14 days after the completion of the treatment cannot be regarded as failures, there were no failures, however, during the period under report. The patients consisted of 32 Europeans, 26 Eurasians, and 114 Asiatics (natives of India, Burma, Malay and Ceylon).

Thirty-seven patients were bitten by animals proved by laboratory tests to have been rabid. The mortality in India among persons bitten by rabid animals is as far as is known from 30 to 50 per cent, it may therefore be claimed that from 12 to 18 of these 37 patients have been saved from death.

The following extracts from the report are of great interest —

"Whenever a patient states that the animal which bit him also bit other persons or animals, endeavours are made to get information from local officials as to their fate. Not much of value has as yet been elicited by this course with the subjoined exceptions —

(1) Eleven persons were bitten by a rabid dog in Bhimavaram Taluk, Kistna District, on May 1st, 1907. One of them came to Coonoor for treatment and remains well. Of the rest 5 died from hydrophobia 30, 53, 58, 60 and 71 days respectively after the bite. The remaining 5 were alive five months afterwards.

(2) Five persons were bitten by a rabid dog near Mangalore on August 2nd, 1907. Two of them died from hydrophobia 3 months and 4 months respectively after the bite. The other three were alive 5 months afterwards."

"So far the treatment employed has been successful in every instance, the case of hydrophobia of which details are given below is not reckoned as a

failure since the patient had delayed in coming for 29 days and the disease broke out before immunity could be established by the inoculations.

The ordinary course consists of one injection daily for 14 days, in all 136 grams of cord substance which has been preserved in glycerine in the ice box for periods varying from 1 day to 42 days.

For severe bites the period of treatment is lengthened to 18 days and from 21 to 256 grams of cord substance are injected.

One patient from Erode Taluk arrived for treatment 29 days after he had been bitten by a mad jackal. He had 4 bites on his left foot on the bare skin. They had not been cauterised. He developed hydrophobia 7 days after his arrival at the Institute and died in the Municipal Hospital 4 days later. The patient stated on his arrival that several sheep which had been bitten by the same jackal died before he left his village, but subsequent enquiries go to show that this was untrue and that the bitten animals had all been sold as soon as possible and could not be traced."

In view of the importance of making a correct diagnosis of the case, we quote *in extenso* the following circular, which will be of interest to all medical officers —

"It is now possible to make a diagnosis of rabies by a microscopic examination of the brain of the affected animals within a couple of days or so, whereas, formerly, the only method available was to inoculate a rabbit from the brain of the suspected animal and wait for rabies to develop, which takes from 10 to 60 days.

The importance of early diagnosis from the point of view of persons bitten is evident.

2. In order to facilitate the microscopic examination of brains, they should be fixed while fresh in a solution made up in the following proportions —

Bichromate of potassium	3 grains
Glacial acetic acid	5 cubic centimetres
Water (distilled preferred)	95 " "
or, stated in other terms —	
Bichromate of potassium	45 grains
Glacial acetic acid	1½ fluid drams
Water (distilled preferred)	3¼ fluid ounces

and despatched the same day to Coonoor. If, however, the time occupied in transit is likely to exceed 48 hours the above proportions of bichromate and acetic acid should be halved.

The parts of the nervous system of greatest value are, in order of merit, the hippocampus major, the cerebellum, the cortex, the medulla and the spinal cord.

3. Brains may be preserved in alcohol 70% or formalin 4% if the above mentioned fixative is unobtainable, but satisfactory results cannot always be obtained thereby.

4. The microscope occasionally fails, generally on account of badly preserved or insufficient material being sent, so that the rabbit test must be resorted to. If the latter is to be successful, a portion of the fresh brain of the animal must be put at once into pure glycerine and despatched to Coonoor. Alcohol, and also the bichromate fixative mentioned above, destroys the virus, so inoculation of a rabbit cannot be performed with such material.

5. In removing the brain of a rabid animal great care must be taken not to touch any part with the naked fingers for fear of infection. Instruments must always be used.

6. To remove the brain of a dog, the simplest way is to fracture the skull with a hammer through the unbroken skin, then cut through the skin and remove the fragments of bone with bone and dissecting forceps. Having exposed the brain, cut off a piece of the cortex with a sterile knife and put it with sterile forceps into a small wide mouthed bottle containing pure glycerine and cork it tightly. The bottle should be surrounded with saw dust or dry grass or cotton wool and packed in a tin or

wooden box. The remainder of the brain should be extracted whole from the skull and divided longitudinally with a knife and put into a wide mouthed bottle containing the bicarbonate fixative. In the case of a large brain several transverse slices should be made to allow the fixative to penetrate more rapidly into the interior.

No antiseptics must be allowed to come into contact with the brain during the process of its removal.

7. Whatever preservative be used its volume must be at least 20 times the bulk of the brain.

8. It is important that the bottle should be filled right up to the stopper with the fluid to prevent the specimen being broken up on the journey by the shaking.

THE TREATMENT OF ELEPHANTIASIS

At a recent meeting of the Medical Section of the Asiatic Society of Bengal, Major C. R. Stevens, FRCS, IMS, of the Calcutta Medical College, showed a very interesting case of an attempt to treat elephantiasis of the leg by surgical means. In the case shown before the society, the operation had been done at two sittings, in the first the mass of elephantoid tissue had been dissected off the front of the leg, below the knee, and subsequently the mass at the back of the leg received similar treatment. The enormous bare areas were immediately skin-grafted and had healed up kindly. The results were at least encouraging, when we consider how hopeless otherwise this condition is.

Our attention has been drawn to this question also by the receipt of reprints of several articles published by Dr. Aldo Castellani, Director of the Tropical Diseases Clinic at Colombo. In a paper read before the Ceylon Branch of the B. M. Association, Dr. Castellani sums up his later experience of this treatment of elephantiasis, which he claims only to be palliative, as follows—

(1) The treatment consists in constant pressure and injections of thiosinamin. Thiosinamin alone or pressure alone have no effect on the disease.

(2) As regards the technique of the treatment, it is advisable to apply in certain cases on the more prominent or hardest parts of the affected limb hard pads or small iron bars or pieces of wood to increase the pressure. After applying these pads the whole limb is bandaged as usual.

(3) The treatment must be prolonged for 5 or 6 months at least, then, when the whole skin has become elastic, strips of the skin and subcutaneous tissue are removed. After operation the patient must wear elastic stockings for a long time.

(4) The treatment gives apparently much better results in old standing cases, with much fibrous tissue, than in cases seen at the beginning of the disease.

(5) In several cases the result has been brilliant, but I fear it is only palliative and the good result may not last long.

As regards the injections of Thiosinamin these are very painful, so Dr. Castellani has employed Merk's Fibriolysin, which is a combination of Thiosinamin with sodium salicylate soluble in water, obtainable in sterile glass ampullæ, each containing 2 cc of liquid corresponding to 0.2 grammes of Thiosinamin. Such injections are usually painless.

The treatment is begun by rest in bed, massage and bandaging of the part, then repeated injections of the drug into various parts of the affected regions, say about 2 cc of Fibriolysin every day or every other day for a month.

In view of the hopelessness of any other method, this plan is worth trying in cases able and willing to undergo the prolonged treatment necessary.

PARASITOLOGY

UNDER this title the enterprising Editor of the well-known quarterly, *The Journal of Hygiene*, has brought out a new Journal or rather a new supplement to the *Journal of Hygiene*.

It has been felt that the latter Journal has been somewhat overburdened of late with papers dealing with the "anatomy of mosquitoes, fleas, protozoa and other parasites—of great importance in themselves, but having only an indirect relation to hygiene and preventive medicine."

The remarkable development of parasitology in recent years demands a means of publication in English for the many original papers dealing with the subject of Parasitology in its widest sense.

We cannot understand either plague, malaria, sleeping sickness, yellow fever, ankylostomiasis, elephantiasis or even typhus fever without a knowledge of the life history of the invertebrate hosts of their parasites, we therefore welcome this new periodical and commend it to the attention of our many readers who are interested in the subject.

This supplementary periodical will appear in parts as material is accumulated, and will, it is expected, make an annual volume of some 500 pages. It is issued in a form identical with the *Journal of Hygiene*, its price annually is 20s or 15s only to subscribers to the *Journal of Hygiene*.

The first number contains a very elaborate paper on Fleas by the Hon. N. C. Rothschild and Karl Jordan, PH.D.

MAJOR G. LAMB, I.M.S., M.D., Senior Member of the Plague Commission, has made all interested in plague his debtor by the compilation of the most useful and interesting summary of the work of the Plague Commission up to date, entitled "*The Etiology and Epidemiology of Plague*." As this summary has been published

by the Sanitary Commissioner with the Government of India for the purpose of widespread distribution in India, we need do no more than welcome it and commend it to the attention of all medical men

As we go to press we have received copies of *Scientific Memoirs*, No 32, being the Typhoid Fever Inquiry Report, and of the new and revised edition of Major Newman's practical and useful book on *Aseptic Surgery* (Thacker, Spink & Co)

THERE will be an Australasian Medical Congress held in Melbourne from 19th to 24th October 1908. Dr H B Allen, the President, writes to say that officers of the I M S and R A M C will be cordially welcomed

Reviews

Outlines of Medical Jurisprudence for India.

—By Lieut Colonel P HELM, F R C P, etc, I M S, and the late J D B GRIBBLE, I C S. Fifth Edition, revised and enlarged Madras, 1908, Higginbotham & Co

THERE is perhaps no subject within the range of medical science which has been so well catered for as medical jurisprudence, and at least three well-known modern works deal with medical jurisprudence for India, viz, Waddell's Edition of Lyon's *Jurisprudence*, Gibbons' *Medical Jurisprudence*, and the book before us, viz, Helm and Gribble's *Outlines*, which in the last twenty years has reached no less than five editions

Owing to the death of Mr J D B Gribble who was co-author in the previous editions, Lieut-Colonel P Helm is entirely responsible for the fifth edition, and has in the present revision availed himself of much recent work on Indian Medical Jurisprudence

This volume has no pretensions to be a complete work of reference, it is modestly entitled 'Outlines', but as a matter of fact contains almost all that is needed for the ordinary practitioner. One great feature of the book is that all medical terms are explained in footnotes which makes the book of especial value to non-medical men. It is a book which can be confidently recommended to civil surgeons, police officers, and pleaders

It is a pity that the author has not referred to recent volumes of the *Indian Medical Gazette*, e.g., an article on rupture of the spleen which does not refer to the papers of Lieutenant-Colonel D G Crawford, or on *ganja* insanity which knows not the papers by Ewens and Robertson-Milne or one on saponification which omits reference to the various papers in recent years discussing

adipocere in India can scarcely be called up to date. In spite of these omissions the book is one of great value and is of great use

Diseases of Infancy and Childhood—By LOUIS FISCHER, M D. Pp xiii and 979, 303 illustrations, several in colours. Published by the F A Davis Co

THIS large book may be considered as consisting of five parts, the first considers of the development and hygiene of the infant, the second, the abnormalities and diseases of the newly born, the third, the feeding in health and diseases, the fourth, the diseases of childhood taken seriatim, and the fifth, a miscellaneous section on home-made foods, gastric and urine examinations, some staining technique, anaesthetics, disinfection, and dosage. The first two parts are good and practical. The third part on feeding is very full, even unnecessarily elaborate in parts, such as in the advice to give milk of different dilutions at children's different feeds on weaning. The portion devoted to the consideration of cow's milk is good, and practical methods of home modification are fully detailed, but in this part the following extraordinary statement is made—"Pepsin will not coagulate milk, hence the hard coagulum of cow's milk that sometimes forms in the infant's stomach is due to acidity of that organ", yet 3 pages further on the author differentiates acid from rennet curds, states that the former are probably not sufficiently firm to set up digestive disturbances, and gives lime salts their proper place in regulating the firmness of the clot. He prefers the use of guaranteed to that of sterilised milk, believing the latter to be less nutritious and to be likely to result in rickets should its use be long continued. Of goat's milk as a substitute for human milk a high opinion is expressed, chiefly on the score that the animal is refractory to tuberculosis. No warning of its susceptibility to Malta fever is given, which is a pity in view of the fact that the circulation of the book in India is desired. Composition tables of many patent artificial foods are printed, and form a valuable feature. The chapters on diseases are disappointing. To mention diarrhoea as a condition which should find a prominent place in a book dealing with diseases of children, its consideration is scattered, and in no place do we find opium advised as useful in its treatment. The cysticercus stage of tapeworm is referred to as the egg, qualified by the word larva in brackets, Santonin is not mentioned in the treatment of worms, the chapter on endocarditis is ludicrously inadequate, pseudo-appendicitis and pseudo-pertussis are considered as requiring diagnosis, it is stated that on auscultation respirations may be absent in emphysema, no internal medicine is recommended for bronchitis, there is an error in fig 165 which represents diphtheria bacilli as magnified 100 times, 1000 is correct, the chapter

on malaria is not up to date, and a change of climate is put before quinine as its best treatment, calcium chloride is not mentioned as being of use in the treatment of hæmophilia or of urticaria, and collapse of the lung is considered as the effect of insanitary surroundings. The chapters on nervous diseases are good, particularly that on cerebral paralysis in children. The book is fully and well illustrated, those in colours being particularly valuable. Though a large amount of labour has obviously been expended on the book, there are a number of inaccuracies and omissions which seriously detract from its value in spite of its having a number of useful points.

The Pocket Osteology—By P. TURNER, M.B., F.R.C.S. (Eng.) London: Baillière, Tindall & Cox. Pp. viii—187. Fcap. 8vo. Price 3s. net.

Dr. PHILIP TURNER, of Guy's, has given to students of anatomy an admirable little volume dealing in small space with the elementary but important subject of osteology. The descriptions are based on those given by Cunningham, Quain and Gray. The book will no doubt be found as useful by students as the companion volume—the "Pocket Anatomy"—and we expect that in future the "Pocket Bones" will be as inseparable from the junior medical students as the "Pocket Anatomy."

Encyclopedia and Dictionary of Medicine and Surgery.—Vol. VII. Ninth to Physiology. Wm. Green and Sons. Edinburgh and London.

We have already expressed a favourable opinion of this great Encyclopedia and Dictionary, and the seventh volume is equal to any of its predecessors. It contains what may well be called monographs on nerves, the nose, paralysis and the peritoneum. Other articles on diseases of the pancreas and on opsonins are also new and valuable. This volume contains 57 articles of over 1,000 words in length, 75 short articles and over 1,190 shorter articles or definitions. The cross references are well arranged and useful.

Among the contributors to this volume will be found the following names, viz.—On the Nose, Cresswell Baker, G. McDonald, H. Tilley, Logan Thomson and St. Clair Thomson; on Obesity, Burney Yeo; on Ovaries, Alban Doran; on Pancreas, Mayo Robson and J. A. Milroy; on Rensselaer Russell on Paralysis, W. T. Ritchie; on Parasites, Sandwith; on Pellagra, Miss Garrett Anderson and M. D'Arcy Power; on the Peritoneum, Kelly, H. Tilley and Horne; on the Pharynx, and Noel Paton on Physiology.

Current Literature

The "Bossi" Cure—In Italy and in Germany, during the last year or eighteen months, renewed interest has been shown in the treatment of osteo malacia. This has been due to the remarkable as-

sertions of Professor Bossi of Genoa, who declares that osteo malacia, even the acute form, developing during pregnancy, may be cured by the injection of adrenalin. This interest in Germany has become so general as to lead to this method of treatment being ordinarily spoken of as the "Bossikur." The interest in the subject has been extended very greatly, during the last few months, by further assertions, of Professor Bossi, based on experimental work on animals, as to the influence of the suprarenal bodies on the circulation in the marrow of bones and, resulting from this, that the exhibition of suprarenal gland extract leads to a cure of the essential failure of nutrition in the bones in rickets, and thus, if adrenalin is given at a sufficiently early time, it will prevent deformities in the bones, especially in those of the pelvis.

In English medical literature, beyond occasional references to the work of Bossi and his German critics in the Review of Current Literature in the *Journal of Obstetrics and Gynaecology of the British Empire*, little notice of Bossi's work has been taken. No doubt this has been due to the fact that osteo malacia is so extremely rare in the British Isles that its importance could only be of an academic character, but the extension of the treatment to the larger field which rickets gives it, as well as the importance of such an extremely definite and striking therapeutical advance, should this, as appears now to be probable, be definitely established, warrants the publication of a résumé of the literature which has appeared on this subject.

Bossi's original papers, and many subsequent papers by others, have all appeared in the *Zentralblatt für Gynäkologie* in 1907, and in the earlier numbers of the present year.

As regards the treatment of osteo malacia by adrenalin, publicity was first given to his experiences on this point by Professor L. M. Bossi of the Women's Clinic in the University of Genoa in the *Zentralblatt für Gynäkologie*, No. 3 of 1907 (January 19th), and, as it was, this article which has led to a succession of further papers, both affirmative of the success of this treatment and in criticism of it, it appears to be worthy of notice in some detail. The paper is entitled "Nebennieren und Osteomalakie," (The Suprarenal Glands and Osteo malacia) and consists of the relation of the details of a case of very acute osteo malacia in a pregnant woman with very short remarks on the rationale of the treatment employed.

The case was the following—

Bellora Angela, 38 years old, admitted into the University Clinic in Genoa on the 27th November 1906. Nothing important in the family history, but from the personal history it is learnt that soon after the establishment of menstruation, which occurred in the 15th year, the patient appeared to have suffered from an affection of the bones of the right hand (as shown by deformities of the 4th metacarpal bone) and also later in the wrist. After this there was severe inflammation of the glands in the axilla and of the neck which had to be removed. Professor Bossi does not distinctly state whether he considered this history to be one of healed tuberculosis of bones and glands. At any rate, the patient married at the age of 23 and remained in good health for many years.

She had had seven previous pregnancies, of which the first resulted in a miscarriage, five in natural labours with nothing remarkable, during their course, whilst during the last she complained of severe pain in the hips as well as of a drawing inwards of the bones of the legs. These pains disappeared after the confinement.

When she came into hospital she was in the eighth month of her eighth pregnancy. Since the beginning of September, and indeed to some extent from the end of the third month of pregnancy, she complained of pains in the upper part and inner side of the thighs and in the hip joints. She was unable to separate the thighs without severe pain in the joints, and in the pubic region, so that when she wished to move in bed she was

compelled to press the knee firmly together. In September she could not sit up in a chair throughout the day, later, by degrees, she had been compelled to remain in bed longer and longer each day.

Professor Bossi demonstrated the case to his class of students on the 29th of November and declared it to be a case of advancing osteo malacia, he based the diagnosis on the above history and on the following conditions which then existed—The pelvic bones, the clavicles and the ribs appeared to be driven upwards and were painful on movement. The hip joints, as well as the tuberosities of the iliac bones, were pressed inwards to a remarkable extent, while the pubes had the appearance of a duck's bill.

In spite of a vigorous tonic treatment, combined with a generous diet, the condition of the patient grew worse, so that she soon was compelled to lay immobile in bed, the deformity of the pelvis increased almost visibly and sleeplessness became a very serious symptom.

Professor Bossi then relates the considerations which led him to use adrenalin. Unfortunately, he gives little in the way of reference to the authorities for his statements, which are that the substance of the suprarenal bodies has a modifying effect on the circulation in the organs of generation as it acts as a contracting agent both on the vessels in those organs and on those of the medulla of bones. Experiments on animals show that the removal of the suprarenal bodies quite specially influences the ovaries and gives rise to lasting disturbances in their functions.

As stated above, finding an ordinary treatment quite useless, Bossi decided, in view of the above considerations and the well known fact that extirpation of the ovaries cures many cases of osteo malacia, to make an experimental use of an extract of suprarenal gland substance. He began on December 16th with one injection of adrenalin (evidently, though not specifically stated, the preparation of Messrs Parke, Davis & Co) in a solution of 1 in 1,000. He used $\frac{1}{2}$ c cm of the solution. Unfortunately, in the translation from Italian into German, a mistake was made which gave rise to considerable doubt in its use in cases in Germany but was later definitely set right. In the German, it says the dose used was $\frac{1}{2}$ cg adrenalin and some doubt was left as to whether it was of the extract itself or of the solution. As, however, this doubt was after many months set at rest, it is only necessary to say that the dose used was $\frac{1}{2}$ c cm of the 1 in 1,000 solution.

This first injection caused no disturbance and indeed the pains were lessened after two hours and the patient had some sleep.

A second injection was given on the 17th December, in the same way as on the previous day, and again there was a distinct retrogression of the pains, and the patient, so she asserted, slept better than she had done for the previous three months.

On the 18th December two injections of $\frac{1}{2}$ c cm were given. The patient began in the early part of the day to move her joints without giving rise to pain and, in the evening, after the second injection, she was able for the first time to leave her bed.

Two more injections were given on the 19th December and the improvement was still more marked. She was able to remain out of bed for three hours and felt so well, and her movements were so free, that she declared a miracle had been effected.

On the 20th the seventh injection was given. A pelvic examination was made on the 21st December, and it was found that the pelvic bones were no longer painful and, what is difficult to believe, they had returned to their normal positions.

Bossi says that before the injections, the fœtus and with it the uterus, through the gradual daily drawing together of the pelvis, had been driven upwards, so

that the abdomen had assumed the form of a broad sack and was so distended as to give rise to anxiety, but now, within these few days, as the patient herself observed, it had grown smaller in a particularly extraordinary manner. Indeed, through the re widening of the pelvic cavity, it became possible for the fœtus to lie in the normal manner. The change had taken place so rapidly that it seemed quite impossible, if, so Bossi says, one had not observed it with one's own eyes.

The further progress of the case is related in another communication by the same author in No 6 of the *Zentralblatt für Gynäkologie* (9th February 1907), from which it appears the patient was given 16 further injections and continued to progress well. It became evident the case was one of twin pregnancy. Labour pains came on naturally on January 7th, 1907, and a male and a female child were born without any difficulty. The children weighed 2,704 and 3,250 grammes respectively. There was no trouble during the puerperium, the patient suckled the children and recovered satisfactorily.

Another case of osteo malacia was admitted to the same clinic on December 29th, 1906, the patient being in the sixth month of pregnancy. She had practically as severe symptoms as in the first case. She was scarcely able to stand, movements caused her the greatest pain, either when attempting to stand, or when lying in bed.

The pelvis was much deformed, having the typical osteo malacic formation. The result of treatment with adrenalin was equally remarkable, after 12 days the woman was able to remain out of bed, she suffered no pain, and began to walk about with the aid of a stick. The dose by injection in this case was from the first, 1 c cm of the 1 in 1,000 solution. In this second paper Professor Bossi relates the results of an experiment he had made on a ewe in the middle period of pregnancy. The animal had its right suprarenal body removed. Although considerable loss of blood resulted from the operation, no immediate inconvenience was noted, and for seven days the animal appeared to be completely normal in all ways. On the eighth day it was observed that the ewe could no longer move about with its accustomed freedom. The next day the articulations of the whole body showed signs of bending in, the thigh bones particularly being drawn inwards. On pulling the legs, pain was evidently produced. The animal appeared to be unable either to rise up or to move about.

Professor Bossi considered this experiment to completely prove his contention that the adrenals exercise a physiological action on the ovaries, and that their destruction is in intimate relationship with the genesis of osteo malacia.

Further equally remarkable success in the treatment of a severe case of osteo malacia by this method is related in a later number of the same weekly publication by Tanturri (page 1628, 1907). The case was of the non gravid class.

In numbers of this publication towards the end of 1907, accounts of the treatment of several cases by German Physicians is to be found. These include several failures, as well as more or less complete successes, whilst in some it is reported that serious side effects had resulted, particularly heart failure and angina like attacks. In No 29 two cases are related by D V Velits, in which no therapeutical results were obtained, but grave symptoms of this character ensued.

Among the more or less successful German cases is one by Reinhardt of Teschen (No 5). This was a case of osteo malacia in a non pregnant woman who was greatly benefited by adrenalin. No bad effects were observed. Another, but less successful case, is related by F Kressmann of Dortmund (No 44). This was a case which came under treatment shortly before

her confinement, was remarkably benefited at first, was confined and shortly afterwards lost to sight for ten days, when she returned in as bad a condition as before. She was given injections of adrenalin solution up to 2Cc with no benefit but no objectional symptoms were caused. Kessmann had only given $\frac{1}{2}$ Cc doses in this case at the first owing to the error in translation in Bossi's first paper, and the unfavourable result may have been due to the smallness of the dose. The case is otherwise interesting, as, in a later report, it is related that the woman was completely cured by a double oophorectomy.

Much discussion took place as regards the dosage of extract of suprarenal gland substance, and as to its physiological action and dangers, in the numbers published towards the close of the year. The most important communications are those from Dr. Maximilian Neu of the Woman's Clinic of the University of Heidelberg, which are to be found in the numbers of the *Zentralblatt für Gynäkologie* for September 21st and December 14th, 1907. Neu, on the authority of observations made by many experimenters, especially of Braun, contends that the dose of any extract of the suprarenal bodies similar to adrenalin should not exceed 0.0001 gram, if in frequently repeated doses. Whereas Bossi had given 5 and 10 times this amount. He contends that doses such as the latter will cause vertigo, vomiting, collapse and other symptoms of heart failure. He takes the opportunity of belauding suprarenin (Hochst), a German preparation, whilst he says adrenalin is variable in strength and is affected by its solution in chlorotone, hence the absence of these symptoms of poisoning from the doses given by Bossi. This does not seem very convincing, as the use of the adrenalin chloride solution of Parke Davis & Co., internally and by injection, for other conditions, notably in India for plague, has shown that a dose of seven or eight minims ($\frac{1}{2}$ cc) can be given without the least fear of bad effects and, from its success in external application, there can be no question of its general physiological activity.

Neu criticises the theory on which Bossi founds his treatment. He declares he has searched the whole literature on the subject and, beyond Bossi's assertions, can find no proof by experiment that the removal of the adrenal bodies causes any functional disturbances of the ovaries or has any influence on the circulation in the marrow of the bones. He says that as a matter of fact it is impossible to remove both adrenals in an animal without causing death. From his own experiments, he declares suprarenal extract has a definite action in the way of causing contractions in the gravid uterus. These experiments, he says, agree with those of Schreier, Kurdinowski and E. Kehler.

In specific criticism of the cases related by Bossi, he goes so far as to say that the settling down of the uterus into the pelvis, noted in the first case, was evidently due to this action of the adrenalin.

He finishes by making a point of the fact that Bossi had not shewn scientific accuracy in his observations, since no internal measurements of the pelvis were made and no Röntgen ray photographs of the bones had been taken.

He relates one case of osteomalacia graviditatis in which he had used suprarenin (Hochst) in a dose of 0.0005 gr with no beneficial effect on the disease, but which had given rise to most severe toxic symptoms.

The move is the position up to the present as regards osteomalacia. It will be seen there have been a sufficient number of well authenticated cases to make it evident that in some cases the beneficial results have been truly astonishing whilst in others, it has failed, and, in the hands of some German physicians, it has been attended with dangerous symptoms, though it seems in most of these cases that either a different preparation to that used by Bossi was employed or the dose of the adrenalin solution was too small.

The Use of Adrenalin in Rickets.—Interest has again quite recently been strongly drawn to Professor Bossi's assertions as to the physiological action of adrenalin owing to another paper of his, which has appeared in the same publication, *Zentralblatt für Gynäkologie*, No. 50 for 1907 (December 14th) entitled "Concerning the Prophylaxis of Deformity of the Pelvis resulting from Rickets." This paper is of much wider interest owing, as has been said before, to the great prevalence of rickets in temperate climates, comparing most markedly in this respect with osteomalacia. As the paper is a very short one, in almost literal translation will be desirable.

Professor Bossi declares that the experimental studies which he had made, extending over many years, had driven him to the conclusion that extirpation of the whole of a suprarenal gland, or indeed of a part only of one gland, after a few days led to a true osteoporosity of the skeleton. In the case of all the sheep in which one of the suprarenal bodies had been extirpated, and who had been radiographed both before and after the operation, a severe osteoporosity of the pelvis with bending in of the bones was found, as well as the clinical phenomena of osteomalacia.

He is shortly to publish the details of these experiments, accompanied by the radio photographs in the *Archiv für Gynäkologie*.

As he has, so he says, by now cured many cases of osteomalacia in women, he therefore feels justified in declaring his experiments prove that the suprarenal bodies exert a powerful influence on the skeleton, they increase the deposition of lime salts and hinder pathological loss of the same. In the case of sheep who have been deprived of one suprarenal body, an abnormal proportion of salines could be detected in the urine.

Professor Bossi was led by these considerations to make use of suprarenal extract to prevent deformity of the pelvic bones in children, the subject of rickets. He relates the cases of two young girls with rickets, to whom he had given recently extract of suprarenal gland substance with very good results.

He then says that he had, in an Italian publication, which, however, is not named, communicated these ideas to the Italian Medical profession generally, this had led to a discussion on the treatment of rickets at the Congress of Pediatrics at Padua on October 7th, 1907. At this Congress several speakers fully confirmed Professor Bossi's statements, amongst whom was Professor Jovane, Assistant in the Children's Clinic at Naples, who had had remarkably good results with the adrenalin treatment in the cases of 18 ricketty children. Professor Jemna, head of the Clinic at Palermo, also related the good results he had obtained in 10 cases of rickets.

A. H. NOIT

ANNUAL REPORTS

THE GOVERNMENT GENERAL HOSPITAL, MADRAS

WE always welcome the printed report of the Government General Hospital, Madras, which is always a mine of useful and interesting matter. The present report for the year 1907 issued from the press on 16th April and we received it a few days after.

LIEUTENANT COLONEL BROWNING, C.I.E., I.M.S., the Senior Medical Officer, writes the administration report and refers to the many improvements effected in the buildings during the year. This hospital contains 500 beds, 149 for Europeans, 324 for natives and 24 for contagious cases. The daily average sick were 46 Europeans and 359 Natives, and the ten year table shows a steady increase in the Native patients attending as in patients.

The total number of OPERATIONS PERFORMED was 6,833, of which 1,835 were on inpatients. Cholera was

epidemic in Madras in September October 1907, and there has been a considerable increase in the number of enteric fever cases admitted (143 cases with a mortality of 9 per cent only)

We are very glad to see an account of the POST COLLEGIATE CLASS for Hospital Assistants (a system which other Medical Schools in India might imitate with great advantage). Fifteen Hospital Assistants underwent this post collegiate course from 1st July to 31st December 1907. They received clinical instruction in the wards and at *post mortem* examinations, and Major Donovan gave them a series of ten lectures on malaria.

LIEUTENANT COLONEL BROWNING gives a very good account of the large amount of work done by Assistant Surgeon Balasimha Rao, M.B., in charge of the X-RAY DEPARTMENT, where over 4,000 examinations were made for the treatment and diagnosis of disease.

One admirable feature of this report is that it gives the detailed reports of the Physicians and Surgeons attached to the hospital.

We quote the following from the report of the First Physician, LIEUTENANT COLONEL R. ROBERTSON, F.R.S. —

MALARIAL FEVERS — There have been no quartan fevers in my wards during the year. Benign tertian is by far the commonest fever in Madras. The malignant variety appears to be imported into Madras in the majority of cases. One case of malignant fever died, the case was that of an infant, three months old, whose blood showed several parasites in each field. Quinine was given by osmum and the temperature brought to normal, but the child died from syncope during the night, two days after the normal temperature had been established.

DYSENTERY — In the treatment of this disease I have tried powdered cinnamon with considerable success both in Natives and Europeans. The patients seem to prefer this mode of treatment to that of Bismuth or Sulphate of Sodium, certainly the flavor is to be preferred, I have combined it with Salol, 30 grains of Cinnamon and 5 of Salol every fourth hour. The results are surprising with weakly natives and children. In amoebic dysentery the Ipecacuanha treatment has been very effective, I have given it in capsules of 30 grains once daily in the early morning, the usual sedative and counterirritant having been previously given. I think it better to administer it in capsules than in the huge boluses of former days. An antidyenteric Vaccine from Kasauli was tried in two cases in one case of acute dysentery, two injections were given and the cure was complete. In the other case previous treatment had been resorted to but failed, on the hypodermic injection being administered recovery, was fairly rapid.

In most of my chronic cases I have irrigated the lower bowel with a solution of protargol 1 per cent with good results. The bowel is first washed out with boric solution and a Jacques stomach tube is inserted through the anus and given a twisting motion, I find it reaches easily in a distance of 18 inches, then the irrigating fluid is passed through.

ENTERIC FEVER — There has been a great increase in the number of admissions for this disease in all my wards. It is impossible to get a history that would shed any light on the causation owing to the ignorance of most of the patients. A considerable number of admissions came from the Adyar Orphanage where there was an epidemic. Three deaths occurred amongst the Europeans and Eurasians, two being due to peritonitis and one from septic poisoning. One native patient was admitted with a severe form of the disease and died of perforation. All cases not detected by clinical symptoms were subjected to Widal's test for confirmation. One curious case occurred in an European girl of 19, a large purpuric rash appeared on both legs particularly the left, the rash showed itself as large reddish blue circles, as large as a rupee, these then became darker in colour, and the cuticle over them became raised and a collection of reddish fluid collected underneath. The odour was very bad and finally gangrene of the affected skin took place. The sores were very indolent in healing, and the patient was very anæmic throughout convalescence. One mild case of enteric was "Widalised" on four occasions by Captain Christophers in a 1-50 dilution with negative results, although the typical rash was present on the body. The treatment followed in my wards consisted mainly of fractional doses of $\frac{1}{2}$ grain of calomel every hour for eight doses per diem. I seldom find diarrhoea started by this treatment, it certainly tends to keep down flatulence. Salivation has only been observed in one case, and it started on the third day after admission in a weakly woman.

MAJOR C. DONOVAN gives the following report on the work done in the wards of the Second Physician —

From the large amount of material available for observation, the following diseases deserve mention — Malaria, Kala azar, Banti's disease, Ankylostomiasis, Strongyloidosis (to adopt American phraseology), Dysentery, Leucæmia, Typhoid fever and Asthmatic bronchitis.

MALARIA — All cases entered under malaria were determined by examination of the peripheral blood and the presence of the merozooidium therein, diagnosis being made from slides stained by Giemsa or the ordinary watery solution of Romanowski.

The total since 8th July was 53, that is, a little over 9 per cent, or separately, Europeans and Eurasians 10.42 per cent and Natives 8.47 per cent. Details of the different types of fever are given in the subjoined table —

	Benign tertian		Malignant Tertian	Mixed Benign and Malignant Tertian	Mixed Quartan and Malignant Tertian	Quartan	Total
	Simple	Double					
Europeans and Eurasians	7	2	7		1		17
Natives	13	6	14	2		1	36
Total	20	8	21	2	1	1	53

In three previous years the number and percentage were 1903, 83.63 per cent, 1904, 71.55 per cent, 1905, 52.98 per cent.

Three species of the malarial organism are parasitic in man in the Madras city and its environment, these are *Plasmodium malariae*, Quartan, *P. vivax*, Benign Tertian and *Laverania malariae*, Malignant Tertian, but from outside these limits, for instance, Berwada and the Andaman Islands single cases of the disputed quotidian species have been detected. From the former Laverania immaculata, the unpigmented and from the latter locality, *L. præcox*, the pigmented Quotidian. As the specificity of the quotidian type of malaria is still *sub judice*, I have incorporated the two cases in question under the common heading of Malignant Tertian.

There were no admissions into my wards for Blackwater fever, a disease prevalent in the hill tracts of Vizagapatam District.

The treatment adopted by me is, as heretofore, the exhibition of quinine sulphate by mouth, never given hypodermically or intramuscularly. The dose is 30 grains of the sulphate dissolved in a dram of dilute sulphuric acid with the necessary adjuncts. No untoward results follow this procedure, the only drawback is the occasional occurrence of vomiting, this is obviated by giving a dose of morphine by

mouth half an hour before the administration of the cinchona alkaloid, or if this device misfires, to substitute 20 grains of the hydrochloride in acid solution instead of the sulphate.

One such large dose (double benign tertian at times requires two) is sufficient to ward off an attack of malaria for a fortnight or three weeks. To guard against relapses, 7 grains of quinine in solution are given twice a week for a month subsequently.

KALA AZAR — This disease is as prevalent as heretofore, although the virulence thereof appears to me to be lessened, thus, it must be admitted, is from the very short observation I have had since July last. What the old physicians would call a "change of type" has taken place. I throw out this suggestion very guardedly, as I have not had the same number of the severe type usually admitted in previous years that is, since 1903, 1904 and 1905.

The number admitted since July was, in the European and Eurasian wards 4 and in the Native 36, a total of 40. Giving a percentage of 2.45 and 8.47 respectively and a total of 6.80.

The subjoined table shows the number and percentage for the years 1903, 1904, 1905 and 1907. The first and last years give only half yearly results —

Other rhynchota or plant frequenting bugs, congeners of the domestic kind, especially those of gregarious habits, are infected with flagellates of the genus *herpetomonas* and

	1903 Half year		1904		1905		1907 Half year	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Europeans and Europeans	1	0.13	16	4.52	22	6.21	4	2.45
Natives	30	5.91	94	10.20	118	11.94	36	8.47
Total	31	4.31	110	8.02	140	10.38	40	6.80

As splenic puncture is abandoned by me on account of the danger of hemorrhage incident on such a procedure, the disease was diagnosed from the characteristic appearance of the leucocytes to be described later on and from the presence of *Leishmania* in the peripheral circulation. A little more than half the cases were detected by the latter method, to be more accurate, 52.7 per cent. In this proportion, the parasites are easily found in a single slide of all cases, both of a mild and severe type. More careful examination of 3 or 4 slides on a similar number of different days would yield a positive find to the extent of about 75 per cent. Leisnie was not available to undertake this more lengthened examination and resource was had to the peculiar appearances of the leucocytes, characteristic, in my view pathognomonic, of this affection.

There is well marked leucopenia, the mononuclears are relatively increased, these are chiefly of the transitional form, of a large size 20 to 25 μ in diameter, with their nuclei very much scalloped, at times bilobed, the two lobes connected by a thin thread and almost simulating the appearance of the polymorphonuclears.

The polymorphonuclears themselves have peculiar minute knobs attached by a slender peduncle to the main portion of the nucleus.

The thin string like cords connecting the masses of the nucleus, as seen under normal conditions, disappear and the nucleus of the leucocyte becomes more uniformly band or ribbon shaped.

The large mononuclears, in some instances, show beautiful mitotic figures.

Of course in all severe cases, for instance, those that have marked pyrexia, bronchopneumonia or dysenteric diarrhoea, the presence of *Leishmania* in the peripheral circulation in the leucocytes is always demonstrable with pyrexia in the polymorphonuclears and with dysenteric diarrhoea in the large transitional mononuclears.

In the mucous sanguineous diarrhoea of this affection, the presence of small sized entamoeba is noted in the motions, they do not answer to the definition of *entamoeba histolytica* of Schaudinn, being much smaller in size, about 10 to 15 μ , while *histolytica* measures 30 to 40 μ in diameter. The smaller amoeba stains more readily with the different Remmowsky modifications, the nucleus and karyosome are very clearly defined, the protoplasm is vacuolated and contains contracted red blood corpuscles and bacteria.

Other organisms present in such dejecta, but not so commonly as the amoeba, are protozoa and nematodes of the genus, — *trichomonas*, *balantidium*, *spirocheta*, *strongyloides* and *neator*.

Captain Patten, I.M.S., has stated that he has succeeded in obtaining the flagellate stage of *Leishmania donovani*, in the gut contents of the bed bug of Madras (*Cimex rotundatus* vel *macrocephalus*). I have, on several occasions, tried to confirm his find by feeding these insects on Kala azar patients, but have not met with any success.

According to Patten, the patient must be in *articulo mortis* and the parasite present in large numbers in the peripheral circulation in the gigantic mononuclears, to the extent of 100 and more in one slide to succeed in this bug feeding experiment.

Such suitable subjects I have not had since July, although a case with over 100 *Leishmania* in the peripheral circulation in one slide was tried with bugs ineffectually, in this instance, it is true, the parasites were present in the protoplasm of the polymorphonuclears and not in the large mononuclears.

Patten has shown me the slides containing the smears of the gut contents of the bugs in which he found the development forms, in these I can confirm the presence of flagellates similar to those obtained in citrate of sodium solution, organisms identical with the flagellate *herpetomonas*.

I have examined over 100 bugs procured at random in Georgetown, none of these contained a flagellate hence it may be stated, from this short experience, that *herpetomonas* is not a natural parasite or rather commensal of the bed bug of Madras.

citithidia. I have found them commonly present in the gut contents of members of the family *reduviidae* and *pentatomidae*, and Patton, in *lygaeidae* and *hydrometidae*.

Hence at present, Patton's view concerning the transmission of Kala azar by bed bugs cannot be accepted in its entirety, that is to say, the *herpetomonads* he found in the gut contents of *cimex rotundatus* may be only natural commensals of the bug, if so, it must be admitted that they are of very infrequent occurrence as such.

In some of the plant frequenting bugs or rhynchota, the forms of *herpetomonas* were almost identical in all details with *Leishmania donovani*, both as found in the human body and in the flagellate stage in the citrate of sodium solution.

My cases have been treated with fuchsin 1 c c, of a 20 per cent solution three times a day, with more or less satisfactory results.

I adopted this treatment on perusal of Nierenstein's article in the *Lancet*, in which he stated that fuchsin is the most promising of the aniline dyes tried in sleeping sickness. The patients in the hospital here are very impatient of a long course of treatment and did not give me an opportunity of noting the results to be obtained from a lengthened term of medication. A boy aged 14 years was the only exception, whom I persuaded to stay for 6 months and there is no doubt but that he improved markedly, he was put on fuchsin, of doses above mentioned in August and discharged a few days ago, perfectly well, the liver and spleen almost reduced to natural limits. In the other cases I was unable to judge, as a month was the longest period I could get them to remain in hospital, however these cases appeared to improve and had no complications. Latterly I have changed from fuchsin to *Liquor Arseni et Hydrargyri Iodidi* and *Vinum antimoniale*, but so far I cannot report results for want of sufficient observation.

Change of air, especially to a dry hot climate, appears to bring about a cure in some cases. A few of my old Kala azar patients have returned to see me, restored to health and apparently quite well. I may mention these places in our Presidency, answering to suitable sanatoria (if I may use the expression) for Kala azar, to wit Kurnool, Onddappali and Anantapur.

BANTY'S DISEASE — Munagan, aged 21 years, unmarried, a tinker by occupation, was admitted into my wards on the 31st August 1907, for an unusually large spleen. On examination it was found that the case was not one of the common splenomegalies usually seen in the hospital, that is to say, the enlargements consequent on malaria and kala azar. The general look of the patient gave the impression of something out of the ordinary being the matter with him. On the day following admission, the blood was examined and showed nothing very characteristic, there were no signs of any marked change in the leucocytes but the red blood corpuscles were much diminished in number, varied in size and in colour. After further careful study of the blood changes to be detailed later on, the diagnosis of splenic anaemia was arrived at and as the liver was markedly cirrhotic and ascites present, the further differentiation in diagnosis was come to, that it was the final stage of this unsatisfactory and very vague syndrome, a veritable case of Banty's Disease.

The history given by the patient is, that he suffered off and on from fever for the last three years, but the spleen was noticed to be enlarged only eleven months ago, about Pungal this year, that is last January. Before he noticed the spleen involvement he had 3 months' continuous fever, latterly the fever was not of this severe type but came at intervals of 8 or 10 days, continuing for 3 or 4 days. He became much emaciated and weakened by the fever. He is one of three children, his sister died aged 30, two years ago from fever; and his brother aged 28, died on 12th November also from fever. The brother's ailment I can vouch for as he was in my wards during that month suffering from amoebic dysentery and malignant tertian. The patient was born and lives in

Georgetown, to be more correct, in Chinnatambi Street near Katwalehauch carrying on the occupation of a tinker, which he learnt as a boy from his uncle, a man of the same trade.

He gives no history of alcoholism or syphilis nor any family tendencies towards disease in particular. His condition has been the same since his admission over two months ago. He was slightly emaciated but for the tumidity of his abdomen, made up for the most part by an enormously enlarged spleen reaching down to the pelvis. He was not anemic in a clinical sense, the tongue was clean and pink in colour, he had not any of the external manifestations of the anaemia he really suffered from when the number of the red blood corpuscles was taken into consideration, in other words, he was not suffering from secondary anaemia such as is so characteristic of ankylostomiasis. His skin was healthy and smooth, no pigmentation or melanoderma, the bulbar conjunctivae displayed an icteric tinge.

His spleen extended from the 7th rib to Poupart's ligament and bulged across, at the level of the umbilicus, 3 inches to the right of the abdomen. The edge was smooth and round, indented by several notches, scalloped so to speak. The feel of the liver surface was hard and smooth but with a smoothness of a hillocky nature, as of undulating stony hillocks well polished by glacial action.

The liver, on the other hand, was considerably reduced in size and extended for 1½ inches below the 6th rib in the mamillary and 2½ inches below the 7th rib in the axillary line, that is, a reduction to a quarter of the normal size.

There was ascites present but what is very strange and unique if the case is to be classed under Banti's Disease the fluid obtained from the abdominal cavity was blood stained. He was tapped on the 9th September last and 8 oz of yellowish red liquid obtained. The cannula was soon withdrawn, as it was feared further drain of such sanguineous material might be dangerous. There was no doubt as to the source of the red colour as red blood corpuscles with perfect unperforated contour were detected under the microscope.

Weeks later a second attempt was made to lighten the load in the patient's abdomen by another paracentesis, 32 oz of the same red coloured fluid were obtained the abdominal cavity was not completely emptied but about the same amount as withdrawn left behind. The liver is only functionally disordered as in ordinary anaemia. The mucine more or less healthy no albumin or unusual amount of bile pigment present. The motions call for no comment. He had since the spleen enlargement slight bleeding off and on from the gums. His temperature manifests but a very slight variation from the normal, on occasions there was a rise of a degree or so in the evenings. The blood changes however were important and with the enlargement of the spleen atrophic cirrhosis of the liver and ascites complete the picture of any diagnosis of the disease. Not to give too lengthy details of the blood the result of two examinations only are considered sufficient. On the 13th September 1907 a few days after the patient's admission, the following facts were noted—

R B C considerably reduced in number, being only 1,500,000 in the cubic millimetre instead of 5,000,000, haemoglobin 35 instead of 100 and the colour index 1.15, 0.15 over the normal. Slight polychromasia, megakaryocytes and 2 normoblasts in a leucocyte count of 500—in other words, a picture of mild primary anaemia.

The leucocytes were decreased in number, being 5,000 instead of 10,000 in the cubic millimetre. The relative frequency of the different kinds were—

Polymorphonuclear	312	62.4 per cent
Mononuclear	47	9.4
Lymphocyte	106	21.2
Eosinophile	35	7.0
	500	100.0

A small relative decrease in the polymorphos and increase in the mononuclears and eosinophiles, but otherwise not indicating any very marked variation from the normal.

Two months after, another blood examination was made on the 12th November, this showed an improvement in the condition of the blood as far as the R B C were concerned. The red cells had increased by nearly a million, haemoglobin 40 and the colour index 0.83 per cent.

A few of the R B C were oval shaped, very slight megaluria in the size of the cells, no polychromasia and no nucleated elements. The leucocytes now numbered 3,500 to the cubic millimetre, their relative quantity remaining almost the same as on the previous occasion. From the foregoing it

Polymorphonuclear	310	62.0 per cent
Mononuclear	43	8.0
Transitional	2	0.4
Lymphocyte	100	20.0
Eosinophile	45	9.0
	500	100.0

will be seen that the cardinal signs of Banti's Disease were present, i.e., enlarged spleen, anaemia, cirrhosis of the liver

and ascites and finally, to clinch the diagnosis, I shall attempt to show by a process of exclusion, that no well recognised attributable cause is forthcoming to explain the patient's condition. Several other diseases give rise to similar if not identical sequelae. In what I call extinct malaria, that is, in which no parasites are present, no schizonts, gametocytes or gametocytes (Schaudinn, the latent forms) it would be hard to differentiate, as Banti's disease is held by some to be the legacy of malaria in which the exciting cause is extinct or spent out but the injured and pathologically enclosed organs, especially the liver and spleen, remain to tell of the previous stages of the malarial organism. There is a certain amount of evidence in favour of this hypothesis, but I cannot offer my opinion from the experience of two cases.

There is no hesitation in excluding leucæmia, the appearance of the blood change at once dismisses any suspicion.

Kala azar was suspected for a long time but after half dozen careful examinations to the peripheral blood no signs were present, the spleen was punctured and no Leishmania found.

Syphilis and tuberculosis do not give rise to such abnormally large spleens as in the patient under question.

Malignant disease again does not present the picture depicted in the signs and symptoms described. The only doubt is from chronic malaria of the extinct type and another factor to strengthen this doubt is that the patient's brother who lived in the same house for years, suffered from malignant tertian.

Before completing our extracts from Major Donovan's report we here reprint the remarks of the other physicians of the hospital on the important question of KALA AZAR—

LIEUTENANT COLONEL W. B. BROWNING writes—

KALA AZAR—Twenty cases remained and 154 were admitted during the year, no correct deduction can be drawn from the more favourable mortality rate 20.6. Still the impression that most of us have is that there are seen fewer cases of the worst type of this disease.

Regarding the question of cure I must say that in common with almost all other medical officers working in Madras I take a very pessimistic view and doubt whether any cases are ever really cured. From causes of which we are at present quite ignorant cases do improve in quite a wonderful manner. Three years ago a Eurasian lad afflicted with a bad type of the disease was removed by his relatives and taken to Amritsar in what was believed to be a moribund condition. Cancerum ovis had set in and he had lost half his plate. He reappeared some months ago to undergo an operation for hernia, he was well nourished and was free from any symptoms but his spleen was palpable and hard, cases of this kind are familiar to most of us. Removal from the endemic area to an inland district appears to exert a beneficial effect.

One of our Assistant Surgeons was under treatment during the year, he was not a native of Madras and probably contracted the disease when a student, he accidentally noticed a lump in his side and came to Madras. He had no symptoms and said he had no fever nor loss in weight, the liver and spleen were slightly enlarged and both kidneys were very loose and could be moved all over the abdomen as low down as the iliac crests. He returned to work in the North Arcot district, but later on was admitted feeling ill and being anemic. The spleen rapidly enlarged, pericard of a low type set in and the parasite was found in the peripheral blood. He was granted leave and went to Coimbatore where he became rapidly worse with high fever, etc., and died. This was an unusually rapid case being under 9 months.

Splenic puncture was adopted in 19 cases with no ill result. It would appear that with certain precautions this method of diagnosis is not a dangerous one, still, the blood condition and other clinical signs make a diagnosis so fairly accurate that I am doubtful if it is justifiable to do splenic puncture at all. All the more do I hold this view when it is borne in mind that in a considerable percentage of cases the parasite can be detected in the peripheral blood. In 162 cases the peripheral blood showed the parasite in 17.5 per cent. This figure I am convinced, does not at all represent the true state of the case. The examination is a tedious one, many slides have to be examined, and finally, the personal factor comes in. Some officers being better microscopists than others. These points are exemplified by the fact that one medical officer, in 36 cases examined found the parasite in 52.7 per cent whereas another in 26 cases failed to find it even once. Above will be found some interesting remarks of Major Donovan on the blood changes found in this disease.

LIEUTENANT COLONEL R. ROBERTSON, I.M.S., writes as follows—

KALA AZAR—Out of 43 cases treated, a considerable number were readmissions. Cases are discharged relieved, and readmission is sought on the recurrence of fever or intestinal troubles. Eleven cases were verified by splenic puncture without bad symptoms supervening, the patients

remaining in bed for 24 hours is insisted on and a broad flannel bandage is wound round the abdomen for support. I am very unsuccessful in finding the parasite in the peripheral circulation, even after adopting the greatest care to get the leucocytes more or less on the edge of the film. It is by no means an easy task as I have gone over four, five or six slides before meeting with success. All the cases treated showed a downhill tendency, no case treated in my wards has showed progress towards cure, the partial disappearance of the spleen in some cases means very little, and the almost complete disappearance in cases associated with diarrhoea is to be expected. I have not noticed any clinical features which can be said to be peculiar to the disease. No form of treatment shows any hope of curing the disease. Quinine for a time seems to keep the disease in check, but progressive weakness persists. Hypodermic injections of atoxyl is without any influence even in full doses (10 mms of a 20 per cent solution daily). This solution seems to occasion considerable pain after injection.

CAPTAIN H. KIRKPATRICK, I.M.S., writes—

KALA AZAR—There were in all 44 cases of Kala azar—42 among natives and 2 among Europeans and Eurasians with 12 deaths. There were in all 3 splenic punctures during life with no death, in all three cases the Leishman Donovan body was found. In two cases the body was found in spleen smear taken *post mortem*. The body was found in only two cases in the peripheral circulation, though all cases which presented the clinical features of the disease were examined. The other cases being diagnosed by clinical signs and symptoms. All the cases had enlarged spleen, pyrexia, pigmentation and a few had in addition cancerum oris and uncontrollable diarrhoea. A Hindu Police constable had marked enlarged spleen, pyrexia which was remittent at first and then of an intermittent type for about twenty days, pigmentation of palms and in both the shins, no diarrhoea, had a slight patch of bronchio pneumonia right apex with expectoration. Repeated examination of sputum under microscope showed no tubercle bacilli or elastic fibres. He was put on Guaiacol carb. grs 5 three times a day. After a few days on this powder there was marked amelioration of all symptoms. This man was tried before with full doses of quinine and arsenic with no effect. Eventually left hospital much benefited. Guaiacol carbonate was the only drug that had any influence in bringing down the temperature of all the Kala azar cases. Atoxyl was tried hypodermically (20 per cent aqueous solution) 20 minims every day on a Kala azar patient in whose peripheral blood Leishmania were found on microscopic examination. The drug had to be stopped after four days on account of the severe burning sensation he had all over the body, which appeared to be a threatening arsenical neuritis. Otherwise treatment was merely symptomatic.

The following remarks from MAJOR DONOVAN'S Report must not be omitted—

ANKYLOSTOMIASIS—Since my return from leave last July, I have given more attention to the identification of the Hook worms in Madras, especially as Stephens of the Liverpool School of Tropical Medicine informed me that the worms he obtained from Madras did not belong to the Old World genus *anchoylostoma*, but were referable to the New World necator. Fourteen cases of ankylostomiasis were admitted, 12 of these resident within the municipal limits of Madras, harboured necator americanus (worms sent to Stephens and my identification verified by him) and two who had been outside this area, had a mixed infection of necator americanus and *anchoylostoma duodenale*. One of these had been to Mauritius as a plantation cooly and the other had come from Aim, North Arcot district. It may be presumed that the ankylostomiasis were imported, but conclusions cannot be drawn from the limited number of 14 cases of this disease.

STRONGYLOIDOSIS—The worm *strongyloides stercoralis* (more commonly known under its older generic synonyms of *anguilula* and *rhaddonema*), is supposed to be a harmless parasite of man and is occasionally met with in cases of diarrhoea, either alone or associated with ankylostomes. One patient admitted under me was very severely affected by these worms, he had myriads of embryos in his loose and frequent motions, the ova in short strings, the embryos and a few parthenogenetic females were present in all the dejecta. Medication had no effect in ridding the sufferer from these pests, thymol was tried in large doses and male fern similarly, quinine in solution by copious enemata introduced by a long tube into the descending colon but with no avail. The patient became much reduced, indeed was at death's door, and left the hospital to die at home. This is the first instance in which I have observed the strongyloides in such large numbers and unassociated with any other helminth give rise to such severe and intractable symptoms.

DYSENTERY—The majority of the 17 cases admitted were caused by enteric bacilli, to be more exact, in 12 the enteric bacilli were found in the motions, the remaining 5 were of a chronic nature, the urine discharges were very watery, conditions unfavourable for the detection of the

parasitic rhizopod. No attempts were made to isolate the Kruse Shiga and Floxner's bacilli. Treatment with opium and/or alone or in combination with opium in the milder and as effectual form as pulvis opiorum compositus, together with large enemata of quinine in solution, gave satisfactory results in cases that could be cured by medication. Those with chronic ulceration and thickening of the large gut are hopeless.

LEUCÆMIA—There were two admissions for this disease, both chronic and consequently of the so-called leucæmyelogenous type. One of the patients was treated with Röntgen's rays with no permanent benefit, he died eventually. The other a hospital ward boy, remained a few days in hospital and sought his discharge before he could be submitted to a course of X ray treatment.

TYPHOID FEVER—This disease appears to be becoming commoner among the native of Madras city, out of the 15 admissions under this head, 6 were in natives. Diagnosis was arrived at by Vidal's reaction 1 in 100, kindly performed for me, as heretofore, by Dr. Chundrasekar, Assistant Professor of Hygiene and Bacteriology, Medical College, Madras. In all cases of Typhoid there is marked relative increase of lymphocytes, a fact I consider of some diagnostic value.

ASTHMATIC BRONCHITIS—Such pulmonary affections present in the peripheral blood a very large increase of eosinophiles, in one instance the unusual eosinophilia of 83 per cent was noted.

CAPT H. KIRKPATRICK, I.M.S. reports on 423 patients treated in the wards of the Third Physician, of whom five were enteric and all recovered. Anemia was "Caused by ANKYLOSTOMIASIS in nearly every case," and such cases were very resistant to thymol, an experience shared by others. There were 29 admissions and 13 deaths from **RENAL DISEASE**, chiefly chronic parenchymatous nephritis. Capt Kirkpatrick finds morbid changes in the kidneys common at autopsies in patients who have died from other causes. Tuberculosis caused eleven deaths out of 41 cases. These cases mostly come to hospital in an advanced state and run a very rapid course. The following cases may be quoted in *extenso*.

Amongst the cases treated during the year was a Hindu woman aged 35 who said that two months previous to admission her illness began by vomiting in hour and a half after a meal, about a month afterwards severe pain became a prominent symptom. This was fairly constant, but was increased by taking food and relieved by vomiting, she never vomited any blood. Her stomach was found to be much dilated reaching to the iliac fossa, peristaltic movements were distinctly visible, passing from left to right over the dilated stomach area, these movements were accompanied by paroxysms of pain. A slightly moveable tumour, the size of a hen's egg, could be distinctly felt below the 9th left rib. A malignant tumour of the pylorus was diagnosed and she was treated by stomach washing preparatory to operation, however after the washings she refused further interference and was simply given Salol. After three weeks, the tumour, vomiting and pain completely disappeared and the patient was able to eat curries and rice with comfort, but the stomach was still dilated and she returned to her home after 6 weeks' treatment. She is now in hospital again (3½ months after her first admission) and has slight discomfort after food, a dilated stomach reaching 2" below the umbilicus but no vomiting or active pain. She has gained 11 lbs. in weight since her first admission and is steadily improving.

Another case which presented some unusual features was that of a Hindu woman, the wife of a sopo, aged 35, who complained of cough, fever and breathlessness for about three weeks. She looked young for her age and had impaired movement of the left side of her chest and absolute dullness except at the apex where skodæ resonance and bronchial breathing were present, elsewhere there was loss of breath sounds and vocal fremitus, the apex beat was in the sixth interspace in the middle line, heart sounds normal, compensatory breathing present over the right side. Her temperature was remittent, 102° in evening, 99° in the morning. She suffered from very severe attacks of dyspnoea. In spite of the fact that the apex beat was displaced to the left and no bacilli were found in the sputum, tuberculous disease of the lung and pleura was diagnosed, the pleura was aspirated but only 10 oz of fluid were drawn off. At the end of the third week of her stay in hospital she had a sudden hæmorrhage from the lung and died in five minutes. At the *post mortem* examination she was found to have an aneurysm of the upper part of the descending thoracic aorta which had pressed on and occluded the left bronchus causing collapse of the lung, the pleura was thickened and some fluid was present in the cavity. The remainder of her aorta and the rest of her arteries were quite healthy. The patient never at any time complained of any pain in the chest, nor was there any tenderness point over the vertebrae.

CAPT KIRKPATRICK reports a mortality of 25 per cent in his KALA AZAR cases, and others were removed from hospital in a hopeless condition, but on the other hand, many left hospital improved, and he agrees with Major Donovan in thinking that the disease may be assuming a milder type. Ankylostomiasis is a serious complication of such cases. The routine treatment was arsenic, iodide of iron and cod liver oil.

CAIT E W BROWNE, I M S, writes the report on the wards of the Fourth Physician, but the physicians in charge for eleven months of the year were Capt Symons, Capt Scraggie and Capt Rai. There were 974 patients treated.

ENTERIC FEVER—Thirty-seven cases were treated during the year with three deaths, giving a percentage of 8.1. All the cases except one gave a positive Widal reaction. Eight cases were sent from Adyar Orphanage where the disease broke out among children in an epidemic form. Bronchitis was present in a good number of cases, double pneumonia and meningitis in two, hemorrhage and diarrhoea in the three. Constipation was a marked feature in 90 per cent of cases treated.

The treatment was entirely symptomatic. Icebag was applied to head in all cases, as it relieved the headache and soothed the nervous symptoms—cold sponging at 103° F wet pack at 104° F till the temperature fell to 101° F. Glycerine and warm water enemata if the bowels for the tendency to constipation. In nearly all cases where diarrhoea was present, it was apparently due to milk being not properly digested, for, as soon as the milk was peptonised, the diarrhoea stopped immediately without any medicine.

The three cases that died deserve mention—

(i) A Hindu male, aged 35 years, was admitted for inguinal hernia and operated on for radical cure by Third Surgeon. Six days after operation the temperature shot up and remained persistently high for some days when he was transferred to this ward as the temperature has nothing to do with operation as the wound had healed up by first intention. Widal was positive. The case proceeded in a more or less normal way until the 30th day when he gradually became worse, developed pneumonia of right lung with marked mental symptoms and died.

(ii) A European, aged 33 years, was admitted for high fever, Widal's reaction being negative twice before admission. But the typical rose spots appeared on 45th day of disease. He was under treatment for a week during which time he suffered from profuse intestinal hemorrhage and hyperpyrexia and died of exhaustion.

(iii) A Eurasian, aged 13 years, was admitted for fever and headache. Widal's reaction was positive. He was apparently doing well till the 20th day of disease when he suddenly developed symptoms of intestinal obstruction suspected to be due to worms. Pulse became very rapid, abdomen got distended and he complained of severe pain about the umbilicus. Fed by rectum for two days, morphia and strychnine given hypodermically to relieve pain and turpentine stupes to abdomen. Pain and distention of abdomen disappeared after four days. Temperature remained at 100°. The patient suddenly developed symptoms of septicæmia (enlarged inguinal and cervical glands) and died the next day.

MALARIA—There were in all 94 specimens of blood examined under microscope, of which 32 were of benign type and 17 malignant. Not a single case of quatern was treated during the year. Fourteen cases were diagnosed as malaria, though there were no malarial parasites in peripheral blood examination as all of them had taken a few doses quinine before they sought admission into hospital. They came in with a days fever and gave all the symptoms of malaria and got well by taking quinine.

The SURGICAL SIDE of the work of the Madras General Hospital is no less important than the Medical.

MAJOR P C GABBETT, I M S, the First Surgeon, reports on 671 operations and 1,066 admissions to his wards. We quote the following notes *in extenso*—

HYDROCELE—76 (including three cases of hydrocele of the cord). As usual, hydrocele operations held the list, though this year it is closely followed by hernia operations. No less than nineteen were double hydroceles.

There were also a large number of cases which had hematoceles on the opposite side, probably originating in hydroceles into which hemorrhage had taken place. Only two hydroceles had chylous contents. I have never heard any satisfactory explanation of the frequency of hydroceles in tropical countries. In one case, the sac was prolonged beyond the reach of the fingers up into the pelvis behind the bladder.

Eversion was practised whenever possible that is to say, whenever the sac was not too thick or too large. The advantages of eversion are undoubted, and I have met with only one case of recurrence during the year when both sides of a double hydrocele refilled. If the sac was very large the thinnest part of it was cut away and the remainder everted, if the sac was too thick, the case was treated like a hematocele.

HÆMATOCELE—17. Frequently associated with hydrocele of the opposite side. The treatment of these cases is unsatisfactory. Eversion of the thick wall is impossible as a rule, and the oozing after excision is extremely troublesome and apt to recur after the patient has left the theatre, while unlike hydroceles they are easily prone to suppuration. A continuous whip suture of catgut all round the cut edges is perhaps the best method of controlling the oozing. In some cases castration is the best course.

HERNIA—

Strangulated	9 with one death
Radical cure	53

I have abandoned any attempt to close the canal by sutures as likely to weaken the muscular defence. Muscle fibres are separated digitally through an incision in the aponeurosis and the sac cleared as high as possible, ligatured, divided, and the upper end allowed to retract into the abdomen and the lower end left *in situ*. Following the practice of Colonels Martland and Browning a search is always made inside the mouth of the sac before ligaturing it for any omentum which can be drawn down and excised. I believe this practice to be a great safeguard against recurrence. The incision in the aponeurosis is closed with the catgut mattress sutures.

If the muscular layer is found atrophied and the opening is one of those large direct gaps in the abdominal wall which admit three or four fingers a silver wire (I suggest that aluminium bronze would be cheaper) flagree is used. This was done three times in inguinal cases and once in a ventral hernia with apparent success. In the latter case a pocket of serous fluid formed which is collected several times and had to be eventually drained but did not interfere with the success of the operation. Sterilization is best effected by the flame of a spirit lamp just before imbedding the flagree.

There were no deaths among these operations for radical cure, but one case of omental hernia had a narrow escape, as ten days afterwards his abdomen had to be opened for intestinal obstruction when three distinct knuks were found in the gut in association with a plastic peritonitis.

The vermiform appendix was twice found in hernial sacs. Three cases of recurrent hernia were met with, one five and one four years after operation. In four cases, adhesion to a pouch of bladder was found. One of these was a thin walled translucent pouch which was mistaken for a hydrocele of cord, was opened and resutured fortunately without any bad result. In the other cases the bladder was recognised. It would appear that if the neck of the sac be cleared as high as possible, it may more frequently be found adherent to the bladder than is generally supposed.

ELEPHANTIASIS OF SCROTUM—13 cases. The largest of these weighed 32 lbs in a patient whose weight apart from the tumour was 105 lbs.

ABSCESS OF LIVER—Twelve cases with six deaths.

AMPUTATIONS—Thirty cases including five cases of Syme's operation seven amputations of penis, four amputations of thigh and one disarticulation of shoulder. Of these there were five deaths.

EXTERNAL URETHROTOMY—In twenty-three cases the methra was opened in the perineum generally for old standing strictures with many fistulae. The dictum of European surgeons that a genuine impassable stricture is rarely met with does certainly not apply to India. In several cases, the urethra has been found almost entirely occluded from the meatus downwards and the patient has for years passed all his urine by multiple fistulae so that the perineum resembles a watering pot and is converted into a mass of scar tissue. The difficulty of finding the methra in such cases is very great. I have recently found a suggestion of Colonel Browning's very useful namely, that by a finger in the rectum a bead of prostatic secretion may be expressed giving a clue to the true passage. Since it is not to be expected that the average patient will or can keep a stricture dilated after he leaves hospital many cases are recurrent after treatment here and elsewhere, and such strictures are peculiarly difficult and intractable. As these old standing cases are often broken down in health, then bladder is septic and overstrained and then kidneys only waiting for an excuse to stop work altogether it is often the wisest policy to make the perineal opening a permanent one. There were two cases of extravasation of urine with one death.

INTESTINAL AND STOMACH SURGERY—A peculiarly unsuccessful record. Five cases of intestinal obstruction, including one volvulus and one strangulation by mesenteric band, were operated upon with four deaths.

Two fatal cases of perforated intestine (one during typhoid fever).

One case of gastric interostomy for multiple ulceration of stomach died from pneumonia and one case of perforation of stomach and one case of gastrostomy for cancer of the oesophagus also died.

APPENDICITIS—Four cases of disease of the appendix were operated upon, two cases in Europeans, one for gangrene.

nous appendicitis and one for recurrent appendicitis. Two cases in natives—one for a tubercular mass in the neighbourhood of the Cæcum (no appendix found) and the other for an abscess in the same situation. It may be noticed that genuine cases of ordinary appendicitis were met with only in Europeans. Appendicitis is undoubtedly infrequent among natives, contrast these figures with the yearly increasing numbers operated upon for this disease in Europe and America.

LAPAROTOMY—The pathology of one case was very inexplicable. A lipomatous tumour weighing 13 lbs. was shelled out of the abdomen apparently originating from nowhere. It was not retroperitoneal in its growth, whatever its origin may have been, the patient made a good recovery.

A large lipomatoma of the lesser peritoneal sac was opened a week after an injury from a carriage accident and gradually closed without trouble.

A case of tubercular peritonitis made a good recovery after laparotomy.

One large hydropneumothoracic cyst was opened and drained by the abdomen and a counter opening in the loin, but left hospital with a urinary fistula in the loin.

General—The following cases were of interest—

A huge multilocular bony tumour of the whole lower jaw, some of the cavities contained stinking pus and some a clear glairy fluid.

Enlarged filarial gland masses in both groins containing a large number of adult filarial worms, one of which was a male.

A fatal case of vesical calculi encysted in a thin walled pouch. The stone was crushed, but during evacuation, emphysema of the abdominal wall was noticed and on opening the bladder suprapubes a perforation of the bladder, probably due to injury of its wall by the lithotrite was found and the prevesical tissue infiltrated with air, lotion and fragments of stone.

Reduction of a dislocation of shoulder of 44 days' standing by manipulation.

A case of Anthrax from Nagari, North Arcot district.

A case of paraplegia after a fall. Laminectomy failed to relieve any pressure on the cord, though a fracture was found.

A piece of steel buried in the muscles of the forearm for four years had formed a most perfect cyst cavity.

NEUROTOMY—A flap was turned up from the front of the elbow joint and the lower end of the divided muscular spiral was dissected out and freed sufficiently to allow it to be drawn across under the biceps and brachialis anticus and sutured into a cleft in the median. Practically no improvement had resulted at the time of discharge.

LIEUTENANT COLONEL F. J. CRAWFORD, I.M.S., was in charge of the wards of the Second Surgeon till May when Captain T. H. Symons, I.M.S., took charge and writes the report. We quote in *extenso* as follows—

EPITHELIOMA CHEEK, LIP, JAW, ETC.—There were 20 cases of this class admitted of which 11 were unfit for operation, due to extent of disease. 3 patients refused any operative treatment. 6 were operated upon, of which 4 were discharged cured for the time being and 2 died, the cause of death in one being *shock* and the other *septic pneumonia*.

MALIGNANT TUMOURS OF THE BREAST—14 cases were admitted in the year, of which 12 were operated upon with 4 deaths. It may be noted that these cases never seek admission until the disease is far advanced, usually a foul septic ulcer is present and the pectoral muscles involved, necessitating complete removal of both pectorals, and sometimes portions of external intercostals. This extensive operation in an underfed and emaciated individual is always followed by great shock. In one case portions of 6th and 7th ribs were removed together with the parietal pleura which was adherent, giving a full view of the right lung and the heart working in the pericardium. Contrary to what Lockwood writes in the *Clinical Journal*, this extensive operation was followed by great shock and death within 12 hours.

MASTOID DISEASE—4 cases of radical cure, one died. Cerebral abscess and other complications were found. P.M. Operation was performed very late in this case. Tilley's operation was performed in these cases, i.e. the cartilage of the ear is slit horizontally and stitched back to the skin wound which is absolutely closed and mastoid antrum, etc., drained through the external auditory meatus.

INGUINAL HERNIA—In boys. There were three cases operated upon and one died. In this case the operation was successful and the wound had healed by first intention. Unfortunately enteritis set in, and the patient succumbed to it. There was a typical case of inguinal hernia in a woman. The operation for radical cure by modified Bassini's method was successfully done.

There were 10 cases of hip joint disease admitted during the year. I would like to draw attention to these cases

because I think the disease is much more common than is usually supposed especially in young adults. In those which had reached the stage of suppuration, opening the abscess and dissecting as much of the abscess wall as possible and thoroughly cleansing the cavity with 1 in 20 carbolic lotion and iodoform emulsion and closing the wound, was followed by excellent results.

A large number of intra capsular and extra capsular fractures of the femur were admitted. These were all treated in a double inclined plane bed with good results. A certain amount of shortening invariably occurred, but not much, and not a single case showed any signs of passive congestion of the bases of the lungs.

CASES—Thyammaiah, a female, aged 40 years, admitted on 8th November 1907, with history of pregnancy 10 months ago and normal periods until three months ago. Since then she had a sanguinary inoffensive greenish discharge. On examination, cervix soft and slightly lacerated and abdominal swelling obviously uterine in character, was soft, flabby, freely moveable, central in position. Cervix admitted index finger and was giving exit to stringy clot (decoloured blood). Cervix dilated with Hegar's dilators and with forceps, a dead foetus was successfully delivered which was surrounded in the uterus by what appeared to be a large blood clot. Uterus contracted down and was freely irrigated with lysol solution 1 per cent and cervix was swabbed with pure lysol. Patient made an uninterrupted recovery.

A CASE OF TRAUMATIC PNEUMONIA—A boy, aged 8 years was admitted on the afternoon of 2nd December 1907, with a history of having been run over by a rubber tyred carriage. On examination a linear abrasion was seen on the right hypochondrium running obliquely from below upwards and inwards. Abdomen tense, tender and distended.

The next day the temperature was 102° F. Pulse 130, small respiration, 40 per minute. Patient very drowsy. 5th December 1907—Temperature still high. Patient drowsy with marked distension of the upper part of the abdomen. Respiration 44, with visible action of the diaphragm. Liver dullness diminished. Posteriorly—dullness at the base of the right lung with high pitched bronchial breathing. No adventitious sounds. Patient had a dry cough.

Treatment—

Turpentine stupes to the chest.

Mist Stimulans 3-4 every 4 hours.

6th December 1907—Temperature 102.8. Pulse 120. Respiration 45. Diminished movement of the right part of the chest. Apex beat in the nipple line. Right chest apex hyperresonant and dullness in the axilla up to the level of the 3rd interspace. Breath sounds harsh all over the right apex with soft distant bronchial breathing in axilla. Behind dullness extends up to beyond the inferior angle of the scapula. Dullness of the character of brick wall. Breathing bronchial in character but distant. On auscultation, a small quantity of sanguinous fluid was withdrawn. The usual treatment for pneumonia was given and the patient recovered.

AN HÆMAPHRODITE—A patient of this class was admitted for cystitis (gonorrhœal in nature). The history of the patient, as stated by her, is, she is unmarried, never menstruated, age 16, and has been "living" with a man for the last 3 months. *Condition of the patient*—Face is of female type, no hair on the lips, breasts undeveloped, the left slightly bigger than the right. Areolæ broader than those of males, nipple smaller than those of females. Chest is of male type. Shoulders not much broader than the hip which is of a male type, the buttocks being not as full as in females. The thigh and calf are of male type. The gait is that of a female. Voice something between male and female. Penum admodum not much developed. Sexual instinct none. *The genital urinary system*—(i) The mons veneris well developed with scarce pubic hair which is confined to the area and does not show any tendency to extend towards the pubes. (ii) Just below this a small imperforate penis (or greatly hypertrophied clitoris with a well defined glans and prepuce, projects forwards for about an inch and a half. The under surface of this organ is grooved along its length and is pinkish in colour. The glans is not indented at the usual place. The prepuce does not seem to be continued laterally to form the nymphæ. (iii) On either side of this organ and extending antero posteriorly two lateral cutaneous folds resembling the labia are seen. (iv) In the cleft between the two folds an inch below the base of the undeveloped penis, a small opening about ½ inch in diameter, guarded by a small fleshy projection, is seen. This opening communicates anteriorly and above with the bladder, while somewhat posteriorly, it leads to a narrow cul-de-sac. (v) No vagina is seen. (vi) Per rectum no uterus is felt, no ovaries, no tubes. (vii) In either of the lateral cutaneous folds is felt a small ovoid body about ½ inch in size—probably a slightly developed testis. The cystitis was cured and the patient discharged.

The Third Surgeon's wards were in charge of CAPTAIN F. F. BLWES, I.M.S., and CAPTAIN E. W. BROWNE, I.M.S.

MAJOR, W J NIBLOCK, I M S who writes the report only rejoined from furlough in December 1907 —

The most important operations performed were—

For radical cure of reducible inguinal hernia 44, cured
For irreducible inguinal hernia 3, 1 death

"The patient who died after operation for hernia had an irreducible, congenital omental hernia of large size. The operation presented no unusual features, a large piece of omentum was removed, for five days after operation the progress of the case was uneventful, there being no discomfort and his bowels were well moved after a dose of Epsom salts on the third day. On the fifth day he had an attack of bilious vomiting to which he said he was commonly subject since coming to India. The vomiting was at first controlled by washing out the stomach, etc., but his condition became rapidly worse on the eighth day and he died on the ninth. The stitches were removed from a healthy wound on the eighth day. There was never any abdominal distension but at the end splashing sounds could be elicited over the left side of abdomen. No *post mortem* examination was allowed. The patient had been treated in the medical wards for polyuria, but there was no glycosuria and the symptoms had subsided."

For strangulated inguinal hernia	15, 1 death
For hydrocele	77, cured
For hematocele	4, "
For elephantiasis of scrotum	7, 1 death
Elephantiasis of leg, removal of elephantoid tissues and grafting	1, relieved
Hepatic abscess (single)	9, 3 deaths
Amputation of penis for carcinoma	6, cured
Carcinoma of cheek	2, "
" lip	2, "
" tongue	1, died
Major amputations	30, 3 deaths
Sequestrectomy	14, no death
Omentopexy for ascites	1, relieved
Enucleation of the prostate by the supra pubic method	1, cured.

Ligature of the common carotid for aneurysm of the innominate was successfully performed by CAPTAIN J W ILLIUS. The following are his notes of the case—

"The case was transferred from Fourth Physician's wards. The aneurysm size 2" x 1 1/2" externally, bulged the right clavicle forward (about 1 1/2 inches) in the neighbourhood of which was the tumour. The common carotid was tied opposite the cricoid cartilage, no untoward difficulties were met with the wound healed by first intention and the patient was transferred back to the Fourth Physician's wards."

Gastro jejunostomy 4 cases, 2 deaths

All the above four cases were transferred from the Fourth Physician's wards—two for dilated stomach and two for cancer of the pylorus. Posterior gastro jejunostomy was performed in all cases. The two cases of dilated stomach are reported to have benefited by the operation, and to have been on ordinary diet for some time before leaving hospital. Personally, however, I cannot see what good can be expected to accrue from the operation if the case is one of simple atonic dilatation without pyloric obstruction.

Intestinal obstruction 3, 2 deaths

One of the cases is interesting. The following is an extract from the operation register—

"The case was transferred from the Fourth Physician's wards. History of four days' complete obstruction with obstinate history of constipation for a long time before. He is a very stout bloated sort of patient. On examination abdomen not much distended, but a very distinct hard swelling can be felt apparently in the region of the sigmoid. Ordinary symptoms of obstruction with vomiting, etc. In fair condition. On cutting down along the outer border of the left rectus and introducing the hand into abdominal cavity it was found that a piece of large intestine was firmly imbedded as a sort of interstitial hernia in the abdominal wall and could not be removed. The incision was continued as far as the mouth of this opening and the gut itself freed. One of the appendices epiploicae was almost gangrenous, but the gut itself was in fair condition and not much distended. Several strong fibrous bands, which were apparently the immediate cause of the trouble, were cut across. Patient had a free motion immediately after operation. During the night he developed lung trouble believed by the Resident Medical Officer (who saw him) to be due to the anæsthetic and died next morning. He had a large fatty heart."

INFECTIVE GRANULOMA—Two cases treated by X rays were almost cured when they left the hospital.

Osteoma of femur 1, cured

"A large very nodular cancellous osteoma of 8 years' duration arising from the upper end of the linea aspera and

growing into the obturator foramen. Patient's walk simulated an old irremediable dislocated hip. Excised through posterior incision, when it shelled off easily, with chisel and mallet. Patient made a good recovery and was able to walk straight before he left the hospital."

Structure urinary fistula	33, no deaths
(a) Rapid dilatation	6, "
(b) Internal methrotomy	1, "
(c) External urethrotomy	23, "
(d) Cock's puncture	1, "
(e) Incision for fistula	2, "

Correspondence

SOME EFFECTS FROM STINGING BY A HORNET (VESPA ORIENTALIS)

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—I publish the following cases as I believe them to be quite unusual.

Case I—A sepoy of the 33rd Sikhs was stung in the axilla at about 8 P.M. on 1st September. In about one minute he fell down in a semi-conscious condition and was immediately carried to hospital on a *charpoy*. On arrival he was pale and somewhat cyanosed, was sweating, the pupils were contracted and the extremities were cold. The respiration was shallow and sighing and the pulse 130 or 140 irregular, and barely perceptible.

He was treated with stychnine, hot water bottles, etc., and the pulse soon became regular and stronger, but he remained cyanosed and complained of a tightness in the throat for about 1 1/2 hours. A slight œdema of the eyelids and face developed also. At 10.30 he had a short but severe rigor at the end of which his temperature was 101.4.

Next morning the temperature was 99 and except for a little weakness and fatigue the patient was well again. He was discharged the following day.

He pointed out to me a large brown and yellow hornet of a kind which is very common in this part of India, and told me it was one of these which had stung him.

Case II—Three days later another sepoy of the same regiment was stung on the head. He at once started for hospital, but became faint on the way and fell down about three or four minutes after he was stung. He was carried to hospital on a *charpoy*. His pulse also was feeble and irregular, and he complained of a feeling of oppression in the precordium and of constriction in the throat. I first saw him about half an hour later, when he was very blue in the lips, and the respiration was shallow and feeble. The pulse was about 110 and small. There was no œdema. About an hour later he felt a chill which was of short duration, and the temperature rose to 100.6. A few hours later he was all right again. He also was able to point to the same insect as his assailant.

Both the above men were in excellent health before they were stung.

Case III—A native officer of my own regiment (57th Rifles I. E. I.) was stung by an insect, which unfortunately he did not see but from the symptoms must I think have been the same as the above. Almost immediately he felt faint and was brought to hospital. He was cyanosed, the respiration was shallow and the pulse rather feeble and rapid. His face and neck became very œdematous and he remained in this condition about 1 hour, after which he slowly improved. There was no chill or rigor and the temperature only rose to 99.2. This patient was not in good health at the time.

For my last case I have no better evidence than some gossip heard in moss. I was told by a man who knew nothing of the above cases, that a native had been stung by a hornet and had immediately fallen down in a faint. He was carried to hospital on a *charpoy* but died on the way.

During the last two months these hornets have been very common here, and I have seen several other cases of stinging by them, but in none of these were there any constitutional symptoms. It is curious that all of the above occurred within about ten days. I have made many enquiries but can not hear of any similar cases.

I sent a specimen of the insect to the Bombay Natural History Society which was very kindly identified for me by Colonel Hurro. He tells me it is *Vespa Orientalis*, which is found in S. Europe, the Punjab, Baluchistan and the N.W. and Central Provinces. He adds that he has been twice stung by it himself but without serious consequences, nor has he ever heard of severe effects being produced.

Yours, etc.,

R C MACWATTERS, M.B.,
CAPTAIN, I.M.S.

PESHAWAR.

AGRA MEDICAL MISSIONARY TRAINING INSTITUTE

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—May I through your columns ask a favour of Government Medical Officers who have the appointing of Hospital Assistants. In former years I find that Christian students from this Institute obtain appointments in railways, native states, etc., and the temptation of private fees along some times higher pay induce lads who are trained at mission expense for mission work on slight excuse to sever their connection with mission work. May I point out that the Edinburgh Medical Mission Committee, which is responsible for the work in Agra, is composed mainly of Edinburgh medical men, and it is in great part the contributions of medical men which go to support this branch.

It is undesirable and troublesome to take legal proceedings against these lads in the way of refunding, when there is a simpler way, namely, for Government men to refuse to accept any of these men without reference to myself. When a lad has honourably fulfilled his conditions, he may honourably go where he pleases, until then I would ask the co-operation of the Indian Medical Service to refrain from making it easy for them to do wrong. I am sure many medical men have taken them on in ignorance that mission money was spent on them for mission service. Mission hospitals are meantime suffering through want of Hospital Assistants.

I am,
Yours faithfully,
WM HUNTLY, M.D., B.Sc., &c.,
Superintendent

EPIDEMIC DROPSY IN THE DARJEELING DISTRICT

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—With reference to Captain Munro's interesting paper in the April number, might I point out that the disease he describes is by no means new in the Darjeeling District. I came in 1901 and since then have almost continually diagnosed cases of Beri Beri. This week three cases have appeared in the hospital. Captain Munro tends to the belief that the disease is Epidemic Dropsy, not Beri Beri. Whether these diseases are one and the same or not I am not prepared to discuss. But in this district, I think there can be no doubt we are dealing with Beri Beri, for the simple reason that we have had the Dropsical and the "Dry" paralytic cases in the hospital at the same time.

In my experience here it is confined to the Bhutia and Chinese races, and especially to the Tibetan section of the Bhutias, and unlike Captain Munro's finding, most of our cases during the past six years have been men.

As to causation the simple fact may be added that 1 oz to 1 lb of tape worms have been disposed of in all our cases.

CHURCH OF SCOTLAND
MISSION HOSPITAL,
KALIMPONG,
April 16th, 1908

I am, Sir,
Yours faithfully,
ANDREW MCKAIG, M.B.,
Ch.B. (Ed.)

BLACKWATER FEVER

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—With reference to the recent correspondence on Blackwater Fever, one is inclined to believe that it is only a pernicious form of malaria, characterised by the profound implication of the blood corpuscles, just as we have the "dysenteric form" or hæmorrhage from the stomach or bowels, so common in the northern parts of India and commonly called "Peshawar fever," the "Comatose form" involving the nervous system, the "Algide form" in which extreme collapse occurs, then there's, what we may call, "malarial pneumonia and jaundice."

Blackwater fever occurs within malarial areas and for the most part it occurs to those who have been some time in the locality and who have had true malarial attacks. The parasites may be found if the blood is examined before the onset of symptoms, then absence may be accounted for by the destruction of the red blood corpuscles, of which the hæmoglobinuria is evidence.

Why some cases should be complicated (if we may call it a complication) with hæmoglobinuria, others with melæna or dysentery, and others again with pneumonia or jaundice, etc., is hard to say at present, unless they arise from the vast numbers of the parasites invading the special organ or system concerned, and why only this particular organ?

Quinine could hardly be a cause of Blackwater fever, for all malarial subjects take quinine some time or the other and still we don't see Blackwater fever in every case, but it is only the isolated case that gets it.

I don't think anyone could deny that there is some other factor or factors at work.

I am, Sir,
Yours faithfully,
G F WHITBREAD

Service Notes

THE NEW WARRANT (*Gazette of India*, 25 April 1908)

THE Governor General in Council is pleased to direct the publication of the following Royal Warrant dated 13th March 1908 amending the rules for promotion, etc., of officers of the Indian Medical Service which were published in Military Department Notification No. 694 of 1905—

EDWARD R. & I.

Whereas we deem it expedient to revise the rules for the promotion and precedence of our Indian Medical Service

Our Will and Pleasure is that our Warrants of 28th November 1903 and 28th June 1905 be cancelled, and that from and after this date the following rules shall be established, and that by these rules Our Viceroy and Governor General in Council shall be governed—

1 The substantive ranks of Medical Officers in Our Indian Military Forces shall be as follows—

Surgeon General (ranking as Major General)
Colonel
Lieutenant Colonel
Major
Captain
Lieutenant

The Director General of Our Indian Medical Service shall hold the substantive rank of Surgeon General, but may rank as Lieutenant General when approved by Our Secretary of State for India in Council.

2 Except as otherwise herein provided a Lieutenant shall be promoted to the rank of Captain on completing three years' full pay service if he has previously qualified in such manner as may be prescribed by Our Secretary of State for India in Council. An officer who has not so qualified may be provisionally promoted, if, in the opinion of Our Secretary of State for India in Council he has not had a reasonable opportunity of qualifying. Such provisional promotion may be cancelled as soon as he has had such an opportunity and has not qualified.

3 Except as otherwise herein provided, a Captain shall be promoted to the rank of Major on completing 12 years' full pay service, but this period may be reduced by six months in the case of an officer who produces satisfactory evidence of progress in any branch of knowledge which is likely to increase his efficiency.

4 Except as otherwise herein provided, a Major shall be promoted to the rank of Lieutenant Colonel on completing eight years' full pay service in the rank of Major.

5 Time on half pay not exceeding one year, shall be allowed to reckon as service for promotion under Articles 2, 3, and 4, where removal to half pay has been the consequence of medical unfitness caused by duty, military or civil.

6 A Captain after at least six years' service, a Major, or a Lieutenant Colonel may be promoted to the next higher rank by brevet for distinguished service in the field or for distinguished service of an exceptional nature other than in the field.

7 A certain number of Lieutenant Colonels may be specially selected for increased pay for ability and merit.

8 Promotion from the rank of Lieutenant Colonel with increased pay to that of Colonel, and from the rank of Colonel to that of Surgeon General, shall be given by selection for ability and merit, and the grounds of such selection shall be stated to Us in writing, and recorded in the Office of Our Secretary of State for India.

9 A Lieutenant Colonel may also be promoted to the rank of Colonel, and a Colonel, to the rank of Surgeon General, for distinguished service in the field. In any such case the Officer shall remain supernumerary in the higher rank until the vacancy to which in the ordinary course, he would have been promoted, or in the case of an Officer promoted to the rank of Colonel, until selection for the rank of Surgeon General.

10 On appointment as Our Honorary Physician or Surgeon under Article 13, an Officer below the rank of Colonel shall be promoted to that rank, remaining supernumerary of his

rank until he would have attained the rank of Colonel in ordinary course. An Officer below the rank of Colonel who may be appointed as Our Honorary Physician or Surgeon after retirement from the Service, shall be granted the honorary rank of Colonel.

11 Exchanges between Officers of Our Indian Medical Service and Officers of Our Royal Army Medical Corps below the rank of Major and transfers of such Officers from either of the above Services to the other, shall be permitted subject to the approval of Our Secretary of State for War and of Our Secretary of State for India in Council, and on the following conditions—

1 That the Officers shall have less than seven years' service.

2 That the senior Officer exchanging shall take the place of the junior on the Departmental List, and shall not be promoted under Article 3, 4, or 5, until the Officer next above him shall have been so promoted.

3 That the junior Officer exchanging shall be placed for seniority next below all Medical Officers whose commissions have the same date as his own.

4 That the Officer transferred shall be placed for seniority below all Medical Officers holding the same rank at the time of his transfer, and shall not be promoted under Article 3, 4, or 5, until the Officer next above him shall have been promoted.

12 With a view to maintain the efficiency of the Service, Medical Officers shall be placed on the Retired List when they attain the following ages—

Director General	62
Surgeon General	} 60
Colonel	
Lieutenant Colonel	} 55
Major	

But a Lieutenant Colonel, who has been specially selected for increased pay, if he attains the age of 55 years before he becomes entitled to the pension for 30 years service, may be retained until completion of such service, and in any special case where it would appear to be for the good of Our Service that an Officer should be continued in employment, he may be so continued, subject in each case to the sanction of Our Secretary of State for India in Council.

13 An Officer appointed on and after the 11th September 1890 who may retire on pension before completing 30 years service, shall be liable, till he completes 55 years of age, to be recalled to duty in case of emergency.

14 Six of the most meritorious Medical Officers of the Service shall be named Our Honorary Physicians, and six Our Honorary Surgeons.

Given at Our Court at St. James' this thirteenth day of March 1908, in the Eighth year of Our Reign.

By His Majesty's Command,
JOHN MORLEY

THE above warrant contains nothing that is very new. The most important point is that by article 4 above a Major who has received accelerated promotion (as per article 3) will be promoted to be Lieutenant Colonel at 19½ years' service, not at 20 years as formerly, i.e., on completion of eight years as a Major. This is important, but it is not quite clear if it will apply (as we presume it does) to all the recent "accelerated" promotions.

We presume that the "certain number" of Lieutenant Colonels to be specially selected (as per article 7) will remain the same as before, i.e., 41, on Bengal 21, Madras 11 and Bombay 9 (as per Royal Warrant article 7 of 28th November 1903).

Article 12 is of very great importance to senior men. We think the clause granting extensions of service to men to complete 30 years' (full pension) service is equitable one, but it must needs lead to a block in promotion at times, and personally, we think that the most satisfactory settlement of this matter would be to grant intermediate pensions to men over 25 years and under 30 years' service. This would be very satisfactory to many men and it would avoid to a very great extent blocks in promotion (see dates of completion of 30 years' service in the new column for Lieutenant-Colonels, I M S, in April Army List, p 460, etc.)

LIEUTENANT COLONEL EDWARD BOVILL I M S, retired, died in England on 1st March 1908. He was born on 9th November 1846, educated at Aberdeen University and Guy's Hospital, taking the degrees of M B O M, at Aberdeen and also the diploma of M R C S in 1871, and entered the Bengal Medical Service on 1st October 1872, becoming Surgeon on 1st July 1873, Surgeon Major on 1st October 1884, Surgeon Lieutenant Colonel on 1st October 1892, and Lieutenant Colonel on the selected list on 19th August 1898. He took the diploma of F R C S England, in 1873, and the degree of M D at Aberdeen in 1891. On 9th November 1901, he retired on attaining the age of fifty five. Subsequent to

his retirement he served as junior member of the Medical Board at the India Office in 1905-07. His only war service was the Diphtheria expedition of 1874-75, on the North West Frontier of India. Most of his service was spent in civil employment in Bengal, where he will be remembered as Civil Surgeon successively of Champaran, Cuttack, Patna, Murshidabad and Howrah.

THE following order on study leave is republished—

In continuation of Department of Military Supply letter No. 1525 G, dated 6th March 1907 forwarding a copy of revised regulations for the grant of study leave to officers of the Indian Medical Service I am directed to say that attention has been called to the inconvenience of permitting an officer on study leave combined with other leave to take the study leave after the expiry of the other leave, with the result that he must return to India either during the study leave or during a further period of leave specially granted for that purpose. It is observed that rule 5 of the existing study leave regulations already implies that if an officer combines other leave with study leave he will not be allowed to spend any period of study leave on the return journey to India, but since the point, as the rules stand at present, appears to be not wholly free from doubt, the Government of India, at the instance of the Right Hon'ble the Secretary of State direct that the following addition be made to paragraph 5 of the rules referred to—

"An officer whose study leave is combined with any other kind of leave will be required to take his period of study leave at such a time as to retain, at its conclusion, a balance of other previously sanctioned leave sufficient to cover his return journey to India."

2 Paragraph 5 of the study leave regulations, as modified above, will be duly published in the Gazette of India.

The 7th April, 1908

RESOLUTION—By the Government of India, Finance Department.

The Government of India have had under their consideration the question of the improvement of the emoluments of the commissioned officers employed in the Assay Department. On appointment as Deputy Assay Masters these officers are, under the orders prescribed in the Resolution of the Government of India, No. 124, dated the 12th May, 1876 paid on the following scale—

Standing on first appointment	Minimum pay	Yearly increment	Maximum pay
	Rs	Rs	Rs
Under 6 years	600	100	1,200
Six years	650		
Seven years	750		

And so on, according to the seniority on entering the department, the initial pay being raised by Rs 100 for each additional year's standing on first appointment. Officers officiating as Deputy Assay Masters draw pay and allowances according to the ordinary rules. Assay Masters draw pay at the rate of Rs 1,750 rising by five equal annual increments to Rs 2,250.

2 The present emoluments are no longer adequate in the case of officers of the Indian Medical Service holding an officiating appointment in the Department, or in the case of senior Deputy Assay Masters, who have reached the maximum pay of the post. The Governor General in Council, with the sanction of the Secretary of State for India, is accordingly pleased to rule—

(i) that an officer officiating as a Deputy Assay Master shall draw the pay to which he would be entitled if he held the appointment permanently,

(ii) that after two years, four years, and six years from the date of attaining to pay at Rs 1,200 a month, a Deputy Assay Master shall receive Rs 1,300, Rs 1,400 and Rs 1,500 a month, respectively,

(iii) that, with effect from the 1st November, 1907, the Assay Master and Deputy Assay Master Calcutta (if they are personally eligible), shall be admitted to the benefits of the Calcutta House Allowance Scheme.

THE following is a list of the I M S officers who have attended the London School of Tropical Medicine, since January 1905 up to the present date—

January—April, 1905 (17th Session)

Lt Col R Robertson
Lt Col T R Mahoney
Major C N C Wimberley
Major C R Pearce

May—July (18th Session)

Lt Col C H Bennett
Lt Col W A Quayle,

October—December (19th Session)
None

January—April, 1906 (20th Session)

Major J K Close
Capt S Anderson (Gained D T M and H, 1906)

May—July (21st Session)

Capt A W Cook Young (Gained D T M and H, 1906)

Major E L Peary
Capt F M White (Gained M D Trop Med 1906)

Capt L P Stephen (Gained D T M & H, 1906)
Major E Wilkinson (Gained D T M & H, 1906)

October—December (22nd Session)

Major J B Smith (Gained D T M & H, 1907)

Lt Col R H Castor

Major S A Harriss (Gained D T M & H, 1907)

January—April 1907 (23rd Session)

Major F R Ozzard

Capt J W F Rait

Major J T Calvert

Capt T G N Stokes

Lt O Berkeley Hill

May—July (24th Session)

Capt W S Wilmore (Gained D T M & H, 1907)

Capt J N Walker (Gained D T M & H, 1907)

Major H C Aitman

Capt J H G Hutchinson (Gained D T M & H, 1907)

Lt C A Godson (Gained D T M & H, 1907)

October—December 1907 (25th Session)

Lt Col C J Salkies

Major W Westropp White

Major G T Birdwood

Capt M J Quinke

January—April, 1908 (26th Session)

Capt C M Goodbody

Major J Jackson

Major C D Dawes

TOTAL NUMBER 33

LIEUTENANT COLONEL J J PRATT, I M S, Civil Surgeon, Fyzabad, privilege leave, combined with furlough, for a total period of nine months, with effect from the 2nd May 1908

LIEUTENANT COLONEL T H SWEENEY, I M S, Civil Surgeon, Benares, privilege leave for two months and twenty five days, with effect from the 8th May 1908

HONORARY LIEUTENANT A ROBERTSON, I S M D, Civil Surgeon, Fatehpur, privilege leave, combined with leave on medical certificate out of India for a total period of eighteen months, from the 15th April 1908

THE services of Major J G Hulbert, M D, I M S (Bengal), are placed permanently at the disposal of the Government of the United Provinces

The services of Captain J D Graham, M B, I M S, are placed temporarily at the disposal of the Government of the United Provinces

LIEUTENANT COLONEL GEORGE AUGUSTUS EMERSON, M B, I M S, Bengal, is permitted to retire from the service, subject to His Majesty's approval, with effect from the 2nd April 1908. Entered the Service on 1st October 1877

CAPTAIN G A SOLTAN, I M S, on plague duty, Benares, to officiate as Civil Surgeon of that district, in addition to his own duties, *vice* Lieutenant Colonel T H Sweeney I M S, granted leave

CAPTAIN IAN M MACRAE I M S, Superintendent Central Jail, Agra, is appointed Medical Officer, Agra Volunteer Rifles

MAJOR C M MATHEW, I M S, made over the Civil Surgeoncy of Myingwe District, Burma, to Lieutenant J Fraser, I S M D, on 15th April

THE undermentioned officers have been permitted by the Secretary of State for India to retire from the service, subject to His Majesty's approval with effect from the dates specified—

Lieutenant Colonel Alfred Ernest Roberts, M B, I M S, Bengal,—21st April 1908. Entered the Service 1st October 1887

Lieutenant Colonel Jarlath French Mullen, M D, I M S, Bengal,—25th May 1908. Entered the Service 30th March 1878

Lieutenant Colonel Frederick George Mardment, I M S, Madras,—21st March 1908. Entered the Service 30th September 1886

LIEUTENANT COLONEL R SHORE, I M S (Bengal), an Agency Surgeon of the 2nd class, is posted as Residency Surgeon at Hyderabad

CAPTAIN J R J TYRRELL, I M S, and Officiating Agency Surgeon of the 2nd class, is posted on return from furlough as Agency Surgeon in Bhopalwar

CAPTAIN A G MCKENDRICK, M B, I M S, is granted an extension of furlough for one day in continuation of the furlough granted to him in the Home Department notification No 335 Medical, dated the 13th April 1907

ON transfer from Sialkot, Major A W T Buist, I M S, is appointed Civil Surgeon of Gurdaspur, and assumed charge of his duties on the forenoon of the 27th of March 1908, relieving Senior Assistant Surgeon Kishan Chaud of the additional charge

MAJOR H SMITH, I M S, Civil Surgeon, Jullundur, has obtained special leave on urgent private affairs for five months, under article 316 of the Civil Service Regulations, with effect from the 1st of May 1908

CAPTAIN M CORRI, I M S, made over charge of the duties of Superintendent of the Lyallpur district jail to Captain D H F Cowie I M S, on the afternoon of the 4th April 1908

MAJOR S E PRALL, I M S, and Lieutenant K G Gharpurey, I M S, respectively delivered over and received charge of the Aden Special Prison on the 29th March 1908, after office hours

CAPTAIN D AHERN, P A M C, and Captain D S O'Keeffe, I M S, respectively delivered over and received medical charge of the Karachi Prison on the 28th November 1907, after office hours

CAPTAIN C S LOWSON, I M S, Superintendent, Central Prison, Ahmedabad, is granted, with effect from the 2nd May 1908 or the subsequent date on which he may be relieved, such privilege leave as may be due to him on that date and four months' study leave in combination with furlough for such period as may bring the combined period of absence up to twelve months

MAJOR A LEVENTON, I M S, Civil Surgeon, Mymensingh, is appointed to be Civil Surgeon, Lakimpur, during the absence on leave of Lieutenant Colonel Carroll, I M S, or until further orders

DR R S ASHF, Civil Surgeon, Faridpur, is appointed to be Civil Surgeon, Mymensingh

ASSISTANT SURGEON GOPAL CHANDRA MUKERJI II is appointed to officiate as Civil Surgeon, Faridpur

CAPTAIN J M HOLMES I M S, took over the collateral charge of the civil surgeoncy of Bhamo from Captain E A Walker on the forenoon of 30th March 1908

COLONEL C H BEATSON, C B, I M S, has been granted combined leave out of India from 20th April till 20th October 1908. He is P M O, Kohat Brigade

UNDER the provisions of Articles 260, 308 (b) and 233 of the Civil Service Regulations, privilege leave to the extent due combined with furlough so as to make up a total period of one year and two months is granted to Major C C S Barry, I M S, officiating Civil Surgeon Rangoon, with effect from the 26th March 1908, or the subsequent date on which he may avail himself of the privilege leave

THE following appointments are ordered in the Burma Medical Department—

Major J Penny, D P H, I M S, is appointed to officiate as Civil Surgeon, Rangoon, in place of Major C C S Barry, I M S, proceeding on leave

Captain A Whitmore, M B, I M S, is appointed to officiate as Junior Civil Surgeon, Rangoon, in place of Major J Penny, D P H, I M S, appointed to officiate as Civil Surgeon

Under the provisions of Article 260 of the Civil Service Regulations, privilege leave for one month is granted to Captain E A Walker, M B, I M S, Civil Surgeon Bharno, with effect from the date on which he may avail himself of it. Captain J M Holmes M B, I M S, is appointed to hold collateral charge of the Civil Surgeoncy at Bharno, in place of Captain E A Walker, M B, I M S, proceeding on leave.

THE services of Lieutenant Colonel W A Quyle, I M S, Civil Surgeon and Superintendent, Lunatic Asylum, Jubbulpoore are placed at the disposal of the Government of India, Army Department, with effect from the date on which he may be relieved of his duties.

On return from the combined leave granted him by Orders No 138, dated the 19th January 1907, and No 2288, dated the 30th October 1907, Lieutenant Colonel A Silcock I M S, Civil Surgeon, is posted to the Jubbulpoore District, as Civil Surgeon.

MAJOR J DAVIDSON, I M S M D, has taken the diploma in tropical medicine at Liverpool.

'Guy's Hospital Gazette' for March 21st, contained an interesting article by Captain Watts, I M S, on plague duty in the Punjab.

LIEUTENANT CHARLES MICHAEL ROBERTS, M B, I M S, is permitted to resign the service subject to His Majesty's approval, with effect from the 13th April 1908.

THE services of Major J G Hulbert, M B, I M S (Bengal), are placed permanently at the disposal of the Government of the United Provinces.

THE services of Captain J D Graham, M B, I M S, are placed temporarily at the disposal of the Government of the United Provinces.

THE services of Captain W J Collinson, M B, I M S, are placed temporarily at the disposal of the Government of the Punjab for employment on plague duty.

THE undermentioned officers are placed on special duty under the orders of the Sanitary Commissioner with the Government of India, with effect from the dates shown against their names.

Captain J C G Kunhardt, I M S —24th February 1908

Captain F N White M D, I M S —29th February 1908

2 This modifies the Home Department notification No 1812, dated the 23rd August 1907, so far as Captain White is concerned.

CAPTAIN M S IRANI, I M S Assistant Plague Medical Officer, Jullundur, has obtained privilege leave of absence for three months, under Article 260 of the Civil Service Regulations with effect from the 15th of May 1908 or the subsequent date from which he may avail himself of it.

LIEUTENANT COLONEL C H BENNETT, M D, I M S, is permitted to retire with effect from 11th February 1908. He was in the Madras service and took the degrees of M D and M CH R U I, in 1876.

MAJOR G M C SMITH, I M S, made over charge of the duties of Superintendent of the Kanai district jail to Lala Maya Das Assistant Surgeon, on the afternoon of the 25th March 1908.

LALA KISHEN CHAND made over charge of the duties of Superintendent of the Gurdaspur district jail to Major A W T Buist, I M S, on the forenoon of the 27th March 1908.

MAJOR A W T BUIST I M S, made over charge of the duties of Superintendent of the Gurdaspur district jail to Lala Kishen Chand on the afternoon of the 27th March 1908.

CAPTAIN D H F COWIN I M S made over charge of the duties of Superintendent of the Jhelum district jail to Captain R A Lloyd, I M S, on the afternoon of the 31st March 1908.

MAJOR H AINSWORTH, I M S on plague duty at Lahore, is appointed to officiate as Medical Officer Patiala State, with effect from the afternoon of the 17th of February 1908, vice Major C H James, I M S, proceeded on leave.

MAJOR B G SETON, I M S (Bengal), is confirmed in the appointment of Secretary to the Director General, Indian Medical Service, with effect from the 21st April 1908.

THE undermentioned officer is granted privilege leave for three months combined with leave out of India on private affairs for three months, under the leave rules of 1896 for the Indian Army, the specific period to count from the date of being struck off duty.

Major B G Seton, I M S (Bengal), Secretary to the Director General, Indian Medical Service, Pension service, seventeenth year, commenced 30th January 1908.

LIEUTENANT COLONEL A T BOWN, I M S (Bengal), is appointed to officiate as Secretary to the Director General, Indian Medical Service, during the absence on leave of Major B G Seton, I M S (Bengal), or until further orders.

MAJOR E W HORT, I M S (Bengal), an Agency Surgeon of the 2nd class, is granted privilege leave for two months and twenty eight days combined with furlough for nine months and two days, with effect from the 5th April 1908, under Articles 233 and 308 (b) of the Civil Service Regulations.

THE services of Captain J S O'Neill, M B, I M S, are placed temporarily at the disposal of the Government of the United Provinces for employment in the Jail Department.

THERAPEUTIC NOTES AND PREPARATIONS, &c

WE have received various papers from the EUSTACE MILES PROTEID FOOD Preparations Company, Chindos Street, London, W C. We observe from the *Lancet*, February 8th, 1908 that "these foods show a high nutritive value." The Proteid Food (according to the *Lancet* analysis) contained 32 per cent of proteins, and mineral salts 71 per cent. The "Infant food" (according to the same authority) contains a well balanced proportion of proteins, fats, carbohydrates, etc., the fat being as much as 21 per cent.

The object of these Eustace Miles Proteid Foods is, as most medical men know, to provide pleasant, light and nourishing meals. Proteid Food is said to be a combination of proteid from various sources in a concentrated form. It is claimed to be free from Uric Acid. This Proteid Food only needs the addition of boiling water or hot milk to make it palatable. All interested in simple food will find information by asking the firm at the address above for books on food values and on cooking.

Recently in a tour in the Himalayas we found the Eustace Miles COCOA most stimulating and refreshing at altitudes of 11,000 and 12,000 ft.

It is hardly necessary for us to direct the attention of our readers to the LITHOLAPAXY INSTRUMENTS made by the famous firm of JOHN WEISS & SON LD of Oxford Street London. Dr D F Keegan, the pioneer of litholapaxy for children in India, has testified to the high quality of Weiss' instruments in a recent article (*J M G*, April 1908, p 122) and no higher opinion is possible.

SANITAS OKOL is a highly reputed disinfectant, put on the market by the well known Sanitas Co. of London. Powell & Co's ASEPTIC OPERATING TABLE is one worth the attention of Civil Surgeons. The latest design carries out the ideas of Lieutenant Colonel Quicke, I M S, of the J J Hospital, Bombay.

S Maw Son and Sons London send us a catalogue of their high pressure STEAM STERILISERS, made of enamelled iron with a copper interior.

We have received a pamphlet on Collard & Co's DIABETIC FOODS. They are so well known, we need only say that they are obtainable from Kemp & Co, Bombay, and B K Paul & Co, Calcutta.

Notice

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs Thacker, Spink & Co, Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs Thacker, Spink & Co, Calcutta.

Annual Subscriptions to "*The Indian Medical Gazette*," Rs 12 including postage, in India Rs 14, including postage, abroad.

Original Articles.

TREATMENT OF LEPROSY WITH X-RAYS
AND HIGH FREQUENCY

By E. A. C. MATTHEWS, M.B. (CANB.), ETC.,

CAPTAIN, I.M.S.,

10th Lancers,

*Late Officiating Superintendent, X Ray Institute of India,
Delhi and Dun*

LEPROSY, like oriental sores, belongs to the group of chronic infective granulomata, it is also allied in many respects to lupus, and as both these diseases are readily and completely cured by exposure to X-Rays, there seemed every reason to expect a similar effect on the ulcerative lesions, if not on other forms, of leprosy. Hitherto, however, the few published results of such treatment in this disease have not been very favourable, and with the view of obtaining some definite information as to the effect of X-Rays and high frequency discharges on the various lesions of leprosy, I have had under prolonged treatment a series of typical cases of this disease, both recent and old-standing. Seven cases were treated representing various stages in both kinds of leprosy, five of which were selected by me from the inmates of the Delhi Dun Leprosy Asylum, and the other two were kindly selected for me by Captain Copinger, I.M.S., from the Puri Leprosy Asylum, as being typical cases of early leprosy.

During the time that these cases were attending the Institute, no other treatment was used except that the ulcerating cases were dressed daily with boracic ointment.

CASES

*Case I—G. H., Eurasian, male, age 27**Family History—No leprosy*

History of disease—Five years ago while sitting before a fire he noticed a smell of burning, and then found that the skin over his shins was being scorched without any sensation of pain or heat, a considerable area of skin was involved, so that the disease must have been in progress some time before this occurrence.

From time to time since then he discovered other areas of anaesthesia over the backs of both forearms and hands, and in the lumbar region, which have gradually increased in size. He does not remember having noticed any irregularities or exaggerations of sensation in the affected parts prior to their becoming anaesthetic.

Ulceration first started three months ago almost simultaneously on the dorsums of both feet, on the under surface of the distal phalanges of both great toes and under the right heel. They all began as small purplish patches over which "blisters" developed, and these eventually burst, leaving unhealthy looking ulcers with a watery blood stained discharge, those on the dorsal aspects were shallow and spreading from the edges, those on the plantar surfaces increasing chiefly in depth with sharply cut margins.

Condition at commencement of treatment—Patient was a very big, powerful man, looking somewhat morose, but otherwise apparently in fairly good health. On the

left foot about the centre of the dorsum there was a shallow ulcer, two inches long by one and a half inches broad, with a few pale granulations and unhealthy looking surface, from which issued a scanty sanious discharge. There was a similar ulcer, but slightly larger, on the dorsum of the right foot. On the plantar aspect of the distal phalanges of both big toes were deep circular ulcers, three quarters of an inch in diameter, the edges being clean cut, hard and slightly undermined, the base of the one on the right foot was nearly a quarter of an inch below the surface and involved the bone, there was a yellowish grey membrane over it from which issued a slight discharge of thin yellowish pus. The one on the left foot was somewhat similar but not quite so deep, did not involve the bone and extended rather more towards the end of the toe. There was also a similar ulcer, one and a quarter inch in diameter, on the base of the right heel, which did not involve the bone.

There was some oedema of both feet and ankles.

There were large areas of anaesthesia involving most of the skin over both shins, and of the back of both forearms and hands, and a large patch, eight inches by four inches in the lumbar region. The ulnar nerves thickened.

The head and upper part of the trunk showed no evidence of disease.

Treatment—A medium Cor's Record tube $4\frac{1}{2}$ inches spark, was used with 12 volts and 4 amperes, and all the ulcers were given five minutes' exposures at a distance of twelve inches from the tube daily for a fortnight except Sundays, and during the following week the length of the exposures was gradually increased to ten minutes daily. The anaesthetic patches were given monopolar applications of the high frequency discharge with the multiple point electrode for fifteen minutes daily.

Progress of the case—The ulcers commenced to heal almost at once, the first change noticed being a diminution of discharge, the dorsal ones were dry and healthy looking within a fortnight, and a well marked line of new epidermis was growing over from the edges. Smears from the ulcers were taken after the twenty eighth exposure, but no bacilli were found. They were quite healed over in forty exposures, though the epidermis covering them was thin and papery, and three weeks later, owing to wearing tight boots, they partially broke down, twenty six further exposures were given with a much better result, and two months later there was firm white skin over them with no scarring or contraction.

The ulcers on the plantar aspect healed more slowly, and it necessitated five months' treatment to effect complete cure, although in the fourth month there was an interval of three weeks owing to an attack of cellulitis preventing his attendance, the one in which bone was exposed was the last to heal, but the final result was excellent, as they were all replaced by apparently normal skin and with practically no deformity.

With regard to the anaesthetic areas, six months' treatment had not caused sensation to return completely, but the size of the patches was considerably reduced, those on the forearms and hands to nearly half. His general health and mental condition were very markedly improved during treatment.

*Case II—A. S., Hindu, male, age 50**Family history—No history of leprosy*

History of disease—It was first noticed ten years ago with the appearance of bullae followed by ulceration of the first phalanges of the fourth and fifth fingers of both hands. Later, ulceration started at the base of the plantar surfaces of both great toes, and the back of the distal phalanx of the right thumb.

Condition at commencement of treatment—There was an ulcer at the base of the right great toe on the plantar surface an inch long, half an inch broad and a quarter of an inch deep, with clean cut edges and a grey membrane covering it, and a similar one in the same situation on the left foot.

The first phalanges of the fourth and fifth fingers of both hands were missing, but there was no ulceration of the stumps

There was considerable superficial ulceration of the back of the right thumb with partial destruction of the nail

Treatment—The same apparatus for X Ray exposures was used as in case I, and the same procedure was adopted except that ten minutes' exposures were given from the first

Progress of the case—Healing in this case was very rapid, and after twenty eight exposures the ulcers on the thumb and left foot had quite healed and the one on the right foot was reduced to the size of a four anna piece. Bacteriological examination of smears from the ulcers after fourteen and twenty eight exposures revealed swarms of bacillus lepræ on both occasions. Unfortunately he then absconded from the asylum and was not traced again

Case III—Z, Hindu, male, age 48

Family history—No history of leprosy

History of disease—Twenty two years ago ulceration first began in the soles of his feet, but progressed very slowly, healing up in one place with great scarring and contraction, and breaking down in another. He has been practically crippled for the past seven or eight years owing to the contraction of his feet

Condition at commencement of treatment—Both feet were greatly scarred, distorted and contracted to about half the normal size. On the soles of both feet were large irregular ulcers, about four inches by two, with undermined edges and very unhealthy looking. The ulnar nerves were felt greatly thickened at the elbow, but there were no other lesions apparent

Treatment—The same apparatus and procedure as in case II

Progress of the case—He had one hundred and ten exposures in all, at the end of which the ulcers were less than two inches by one in size, covered with healthy granulations and skin spreading from the edges, with no scarring or contraction. Bacteriological examination showed no bacillus lepræ present

Case IV—J, Hindu, male, age 25

Family history—No history of leprosy

History of disease—He stated that he first noticed it six or seven years ago when lumps began to appear on his face, progressing very slowly to the present condition

Condition at commencement of treatment—There was a typical "Facies Leontina" with large hard nodules all over the face, most marked in the frontal and labial regions, and the alæ of the nose were greatly thickened and flattened

Treatment—The same apparatus and exposures were used as in the other cases, the eyes being protected by four thicknesses of lead foil cut into the shape of a pair of spectacles. He was treated for nearly three months with apparently little result except that the nodules were somewhat softer, the tube was then brought to within eight inches of the face, which produced slight reaction after four weeks, the exposures were stopped for a week and the reaction disappeared, when treatment was continued for a month and then ceased. There was then a marked difference in his appearance, the frontal nodules were quite soft and very much reduced in size, and the lips were quite normal with no sign of scarring or contraction

Case V—K, Hindu, male, age 15

Family history—No history of leprosy

History of disease—Said to be of two years' duration, but appeared to be of much longer standing

Condition at commencement of treatment—There were scattered nodules over the face, with general thickening and wrinkling of the skin, and considerable enlargement of both pinnæ, there were irregularly oval patches of anaesthesia, about five inches by two, over the front of both shins

The ulnar nerves were felt slightly thickened at the elbow

Treatment—The same procedure and apparatus were used as in case I, X Rays being used for the face and high frequency discharges for the legs

Progress of the case—Gradual improvement was noticed almost from the first, and after a hundred exposures the nodules on the face had very nearly disappeared, and the anaesthetic areas were reduced by half. Unfortunately he, too, absconded then, and was not traced again

Case VI—G, Hindu, male, age 8

Family history—Mother in asylum with leprosy. No other relatives known to be affected

History of disease—He is said to have had it from infancy

Condition on 1st October, 1907—There were hard firm nodules all over the face and ears. The skin of the nose and lips, and both pinnæ were greatly thickened, the latter to about twice the normal size

Treatment—With X Rays as in case IV. Exposures of ten minutes daily at a distance of twelve inches, reduced to eight inches after a month

Condition on 30th January, 1908—All the nodules had softened, the nose and lips were greatly reduced in size, the ears to a less extent. He had ninety-two sittings in all

Case VII—P S, Hindu, male, age 9

Family history—Father died of leprosy in an asylum. No other relatives known to be affected

History of disease—A patch of anaesthesia was first noticed on the outer side of the left knee four years ago, he states that it has gradually increased since then to its present size

Condition on 1st October, 1907—There was a more or less oval anaesthetic area of skin about four inches by three on the outer side of the left knee, but normal in appearance, the ulnar nerves were very slightly thickened, but there were no other lesions

Treatment—For the first forty-five sittings he was given bipolar high frequency applications on the condensation couch with glass electrodes, after which this treatment was combined with ten minute X Ray exposures at twelve inches, daily

Condition on 30th January, 1908—The anaesthetic area was reduced in size to two inches by one

These results of the treatment of the various types of leprosy prove conclusively that it is the only method yet tried which has produced any real effect on the progress of every form of the disease. Other methods have from time to time been advocated, but have not stood any real tests, the temporary good effects being explained by spontaneous healing, and now-a-days treatment is generally only palliative and symptomatic

Taking first the treatment in ulcerating cases, the effect produced is very similar to that of X-Rays on all chronic ulcers, a rapid improvement in the amount of discharge and general condition of the ulceration followed by a gradual but complete healing without scarring or contraction, and the appearance instead of almost normal skin, thus differing completely from the spontaneously healed ulcer which invariably leaves much scarring and distortion

The long-continued presence of bacilli in case II is remarkable, as the effect of X-Rays on most infective ulcerations is to produce a very rapid disappearance of the bacilli, due to the action of the tissues themselves, X-Rays having no effect on cultures outside the body, and the difference observed in the case of

leprosy is probably accounted for by the ulceration being trophic in character, the cell elements of the unhealed portions remaining in a state of lowered vitality much longer.

Next as to nodular leprosy, the effect of X-Rays is definite and well marked, the result of treatment appearing more quickly in cases with discrete nodules as in case IV than in such patients as cases V and VI, showing the importance of getting the patients early. Here, again, the treatment is long and tedious, but the result is very different from the appearance of the few who are cured spontaneously when the nodules soften and become absorbed, leaving a well-marked scar, whereas under X-Rays the skin gradually resumes its normal state. In these cases the treatment should be pushed to a stage just short of producing reaction in order to start the healing process.

Lastly, cases of anæsthetic leprosy in the earlier stages are also definitely improved by a combination of X-Ray exposures and high frequency discharges, the former being probably the more effectual but only applicable in cases where the patches of anæsthesia are small as in case VII.

Conclusion—The results in these cases go to show that exposure to X-Rays forms a very valuable means of treating leprosy in all forms and stages of the disease. It cannot be claimed, of course, that they afford any proof of the permanent cure of the disease, but a treatment which can give such extreme benefit as occurred in case I, and which did not fail to produce marked improvement in all, seems to justify its adoption for the future. The drawbacks to it are the initial cost of the apparatus, the electrical supply, which are neither very great, and the length of time required, which is of minor importance in institutions and which will probably be considerably reduced with further experience.

Finally, I must express my indebtedness to Assistant-Surgeon T. B. Butcher and Hospital Assistant Syed Abdul Basil of the X-Ray Institute for valuable assistance in carrying out the detail of treatment.

RAT DESTRUCTION OPERATIONS IN THE PUNJAB *

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A—PRELIMINARY NOTE

RAT-DESTRUCTION was first taken up in 1905, and has been carried out in a large number of towns and villages since. In the season 1905-6 some 3,000 villages and towns, and in 1906-7, 8,650 villages and 70 municipal towns, were treated. It has been a time of experiment in a new measure, of evolution and gradual improvement, and, without going into the

various methods which have been tried, more or less successfully, it will only be necessary to discuss in this report the stage at which we have arrived. It can be said very decidedly that of all anti-plague measures, rat-destruction is by far the easiest to carry out and more readily accepted by the people than any other. Large areas, including whole districts, have been ratted with little or no opposition, and this would have been quite impossible in the case of either evacuation or inoculation. The people understand the connection between rats and plague, and rat-destruction operations involve less interference with their comfort and customs than other measures. Jains are practically the only class who will not accept it. This article may be conveniently divided into three parts, the first dealing with the methods employed, the second with the effect on plague, the third containing a summary of the whole, and conclusions.

I—METHODS

Three methods have been employed in carrying out rat-destruction: chemical poison, traps, and bacterial substances, producing epizootic disease among rats.

A—Poison

A phosphorus paste has been found to be the most effective poison and superior to arsenic, strychnia and others, it is very fatal to rats, and has the additional advantage of being less dangerous to man than other poisons. Common Sense Rat Exterminator was first used, but was soon discarded in favour of "Mushicide," a paste containing about 2½ per cent phosphorus manufactured by a native firm. The extent to which this has been used may be gauged from the fact that up to the present we have bought some 32 tons. Experiments have been made with a view to finding out a formula for an effective poison. This has now been done, and the manufacture of our own poison will be begun shortly. The following is the procedure adopted in carrying out poisoning operations. The contents of a tin of the poison are thoroughly mixed with a seer of guri or treacle, sufficient atar being added to make a stiff paste, this is rolled into large pills, and is enough to make some 1,600 fatal baits. Originally baits were made by spreading the poison on *chapatis*, which were then cut into inch squares. The pill method is superior, because baits can be prepared more rapidly, the poison does not volatilize and the baits retain their poisonous qualities for some time, they are also less luminous in the dark, and, therefore, more readily taken by rats. These baits are placed about 20-40 to each house, in places that are practically only accessible to the rat, which excludes all danger to children and domestic animals, such places are in the rat holes themselves, behind boxes, underneath corn bins, on the tops

* Being a Report to the Government of the Punjab

of the wall supporting the roof, etc. As large an area as practicable should be treated in this way, at a single operation, in order to give as great a shock as possible to the rat population before they recognize the dangerous character of the bait. Baitings on successive days have been found to have no advantage over the single baiting method. Baits are prepared in the morning and laid in the afternoon and evening. For the preparation and placing of the baits a compounder and three coolies are usually employed, half Muhammadans and half Hindus. Such agency can ordinarily prepare and lay, in a day, from 9,000 to 12,000 baits, that is to say, they can thoroughly treat a village of 400 houses, approximate population 2,000—2,400. A Hospital Assistant or Assistant-Surgeon can supervise three or four such gangs operating in large villages or adjacent small villages. Where the active co-operation of the inhabitants is obtained, more work than this can be done.

If the baits are properly placed, they may be allowed to remain, instructions being issued that all village sweepings for the next week should be burnt otherwise, baits will find their way to the village rubbish heap, where fowls, pigs, etc., may find and eat them. The dead rats found are collected and buried or burnt.

The result of this operation is that the locality treated is rendered fairly rat-free for a certain length of time, rats, however, gradually reappear and breed up to their original numbers. This rat-free period varies with the size of the place, the amount of rat infestation and the completeness of the operation, it ranges from a week or two to some months, the larger the locality, the shorter the period of freedom. The number of rats found dead after a baiting campaign of this sort varies very much, it is generally considered to be not more than a third or fourth, at least, of the total mortality; probably, the majority die in their burrows and in places where they are not discovered, there may be, in addition, a flight, as rats usually leave a place when excessive mortality occurs among them. There is no evidence, however, of rats migrating to other villages after baiting operations. Rats are found dead on the morning following the operation, in rather small numbers, on the second and third mornings the biggest bag is obtained and the mortality continues for a week. The following figures will give a general idea of the mortality caused by a single poisoning, the number of rats given is that of the rats collected on the first and second mornings only, after baiting, the villages were in the Lahore district and were baited between October 1st and November 17th, 1906 —

Number of villages	Number of houses baited	Rats found dead	Dead rats per house
1,233	125,692	148,145	1.2

In Lahore city, (population 187,000,) 1,452,000 baits were laid between October 15th and December 29th, 1906, and the number of rats collected (the morning after baiting) was 35,687. In a certain number of villages, the local officials were asked, in addition, to make a careful count of all rats that could be collected as long as mortality continued —

Number of villages	Number of houses baited	Number of dead rats reported by officials	Dead rats per house
845	80,855	354,736	4.4

or practically four times the number found on first and second mornings. I personally consider that the total mortality must be reckoned at, at least 4 or 5 rats per house, judging from the large number of baits that are taken, it is possibly much more.

The following figures show the result in 259 villages baited for a second time in February and March —

Number of villages	Number of houses baited	Rats found dead	Dead rats per house
259	21,333	17,302	8

In these second baitings, proportionately two-thirds of the original numbers were obtained.

A rat-poisoning campaign, carried out at a single operation, will render a locality fairly rat-free for a certain period, it is, therefore, only a *temporary* expedient, which must be repeated at intervals, if the rat population is to be kept down. With the staff available and the enormous area involved, it has been impossible to treat localities often enough, and we have, as a rule, had to limit such operations to two during the season, one in September-October and another in February, these times being selected because they anticipate the periods when rat fecundity is most marked and plague most active, autumn and spring.

B — Traps

Trapping has this great advantage over poisoning, that it can be carried on continuously and thus be a permanent instead of a temporary measure. One thing is, however, necessary, that there should be a local supervision, it is, accordingly, only possible to carry it on properly in large towns and such places where supervision can be obtained. We are gradually introducing trapping in all the municipal towns of the province as a permanent system and part of the ordinary sanitation, and we are extending it to other small towns and dangerous villages, as far as possible. To be of any use, trapping must remove more rats than can be compensated for by breeding, a minimum number of traps, 2 per cent of population, is advised, to be increased

wherever possible, until, in time, perhaps every house will have a trap. That this system will actually reduce the rat population, is fairly well shown by the results. In thirteen villages, population 31,316, baiting was done, and as a result 9,739 dead rats were collected. In thirteen similar villages, population 45,695, trapping was carried on with 847 traps, about 2 per cent of population, for an average period of two months, the numbers trapped during this period amounting to about 45 per cent of the population or say 3 per house, at the end of this time they were baited, 1,663 dead rats were found, judging from the other figures, had trapping not been carried out, 14,210 dead rats would have been found, it appears, therefore, that by trapping the rat population had been reduced to less than one-eighth in the two months. Two villages, old and new Algon, about half-a mile apart, and with a similar sanitary condition, produced very similar bags of rats when baited during last season. Near Algon, half as large again as the other, was trapped for two months, after which baiting produced 104 dead rats only, in old Algon, baited on the same day, 872 dead rats were found. The trapping is carried out on the following system—One man is engaged to look after 50 to 100 traps and he baits and places these traps as directed, he is provided with a collecting trap in which, in the morning, he collects the captured rats, at the same time rebaiting and replacing the rat traps. The collecting cage, with the rats, is taken to the dispensary and immersed in a tub containing phenyle and water, the dead rats are counted and recorded by the Hospital Assistant or Assistant Surgeon and are taken away and buried by the conservancy staff. If rats are being caught in an infected locality, they are burnt. Traps are concentrated in an area for 3 or 4 days, then moved on to another, in time coming back to the first, and so on, perpetually. A very efficient trap is the Rawalpindi one, built on the "Wonder" pattern, in a single one of which as many as 39 rats have been caught in a night, these traps must be made of steel wire, as galvanised iron is too soft. All traps must be cleaned once a week by rubbing them over with a little sweet oil, this is attractive to rats and preserves the traps from rust. Attention must be paid to varying the baiting and circumventing, as far as possible, the cunning of the rat. In villages of about 2,000 or 3,000 inhabitants and in town the number of traps should be larger, 3, 4 or 5 per cent.

Trapping may be combined with poisoning, and a poisoning campaign is recommended before the plague season commences in September or October, to reduce the rat population as far as possible, subsequent increase being prevented by the trapping. Subsidiary poisoning campaigns can be carried out, if the numbers caught in traps indicate the necessity. When infection appears, traps should be concentrated

round the infected area in the hope of preventing the spread of the disease, the rats caught must be drowned in phenyle solution and then burnt. The removal of rats by trapping, to be effectual, must be carried out continuously as a permanent system and part of the ordinary sanitary routine and with sufficient energy to ensure that more rats are removed than breeding can compensate for.

C—Infective disease.

A great advance in rat-destruction methods would be accomplished could an infective disease, non-communicable to man and animals, be introduced among rats, which would spread as a fatal epidemic. Danyz virus, azo and ratin are substances which have been tried, but our experience with them has not been fortunate. It seems that virulence rapidly attenuates and, although rats that actually eat the virus may die, a fatal epidemic is not produced to any extent. This practically is the same thing as poisoning with phosphorus, while it is infinitely more expensive. I think that a really satisfactory virus is yet to seek.

II—EFFECT ON PLAGUE.

Before considering the actual figures that have been obtained, it is necessary to point out some of the difficulties that render it impossible to compile accurate statistics. In the first place, rat-destruction by poisoning carried out by the method we consider the best, a single laying of poisoned baits, however successfully done, does not completely exterminate the rats in a locality and, in practice, the degrees of success attained vary greatly, objections are met, houses have to be left unbaited, baits may be removed after they are laid, and the thoroughness of the operation more or less discounted. Again, the effect is not permanent, but gradually disappears, as rats breed again up to their original numbers, and the locality becomes as favourable soil as ever for the spread of plague, it would be manifestly unfair, therefore, because a plague epidemic occurs in a village some months after ratting, to say that the operation has failed. In preparing the figures given, however, it has not been possible to take all these factors into consideration, if it had been, they would have been much more favourable to the effect of rat-destruction than they appear. The opinion of all officers actually engaged in these rat-destruction operations is, that the measure has great value, and I think this is really stronger evidence than the actual figures themselves. The extreme virulence of the epidemic during the season of 1906-07 masked, to a great extent, the good that was effected by rat-destruction, refugees from infected areas swarmed into places which had been kept free for a long time, infection was imported again and again, and it often eventually took root and spread.

Effect in reducing the number of villages infected—The effect of rat-destruction in reducing the number of villages infected, as judged from the figures available, has been very marked, in order to judge of its success, areas were taken which, as nearly as possible, presented the same conditions, and those which had been ratted were compared with those which had not been so treated. Large areas were taken in the Amritsar, Siálkot, Ferozepore, Gujrat, Gujranwála, Hoshiarpur, Ambála and Ráwalpindi districts and compared with each other, and the results are given below —

Class of village	Total number	Number subsequently infected	Number remained free	Per cent remaining free
Villages ratted before infection	3,237	1,666	1,571	48
Villages not ratted	1,592	1,053	539	34

It will be seen that a very much higher percentage of villages, 48 as compared with 34, remained free in the ratted than in the non-ratted areas. There have been, of course, many individual instances in which no apparent good has resulted, but in nearly all cases one of the three following explanations will be found to account for the failure, of these, the third is the most common — (a) The villagers buried or otherwise got rid of the baits, so that no rats were killed. (b) There was actually a rat epizootic going on when the baiting was done, which was not detected at the time. (c) A long interval between the ratting and the village becoming infected, during which the rat population had again increased greatly in numbers.

Effect in preventing spread of plague from infected to healthy localities—It is impossible to give figures to show this, but the evidence is strongly in favour of rat-destruction, and villages surrounded by infection have been kept free by this means, for instance, the villages Dhandlán, Kheira and others in the Karnál district, which had been ratted, remained free, although surrounded by non-ratted and infected villages. Again, it has proved a useful measure in reducing the danger of infection spreading from a focus, and to this end cordons of ratted villages have been made round an infected one.

Effect in delaying the epidemic—Practically no village becomes infected immediately after ratting, although importation may frequently occur, as rats return, however, the immunity gradually fades and importation becomes more and more likely to infect the rat and produce an epidemic, which will vary in severity with the extent to which rats have returned.

Effect on the severity of the epidemic in villages—Areas were taken in seven districts in which villages ratted and non-ratted were

exposed to the danger of plague infection under, as nearly as possible, the same conditions. The results are shown in the following table —

Infected villages	Total number	Total population	Total plague deaths	Plague deaths per cent of population
(a) Villages ratted before plague appeared	985	650,460	19,303	3.0
(b) Villages ratted after plague had broken out	209	201,217	10,132	5.0
(c) Villages never ratted	1,249	633,906	34,911	5.5

This shows that the average effect of rat-destruction, carried out before plague appeared, was to considerably reduce the severity of the subsequent epidemic. In the case of villages which were ratted after plague had appeared, but little reduction in the total mortality was effected. It must be admitted that the results in individual localities are very discordant, this is due to the temporary nature of the protection afforded by a rat-poisoning campaign. The statement given at the end of this article is worthy of careful consideration. In it are given the results of ratting in twenty villages and towns which have annually suffered more or less severely from plague, since the Amritsar district was first invaded. These villages have been selected, not because the results are particularly favourable, but because they were under special observation and very carefully treated and watched. The value of the measure is forcibly brought out by these figures, they give a much clearer idea of the protection afforded than those collected from large areas and massed together.

Effect on the length of the epidemic—Taking the same areas that provided the figures given in the preceding paragraph, the following table shows the effect —

Infected village	Total number	Total population	Average length of epidemic in weeks
(a) Villages ratted before plague appeared	985	650,460	4.5
(b) Villages ratted after plague had broken out	209	201,217	7.0
(c) Villages not ratted	1,249	633,906	5.2

It will be seen that epidemics occurring after ratting were rather shorter than those occurring in non-ratted villages. On the other hand, in villages where ratting was carried out after plague had appeared, the length of the epidemic was considerably increased. Figures were also taken from a large number of villages that had

been severely affected in previous years. These, it will be seen, corroborate those given above —

Infected villages	Total number	Total population	Average length of epidemic in weeks
(a) Villages ratted before plague appeared	2,129	1,247,188	11
(b) Villages ratted after plague had broken out	220	201,086	7.0
(c) Villages never ratted	1,397	749,249	5.3

Effect in preventing recrudescence—If by carrying out rat-destruction in localities where plague is considered likely to recrudescence after an interval of apparent freedom, we can prevent the reappearance of the disease, this measure must be of the greatest value in mitigating the seasonal epidemic, for not only will the epidemic in the locality itself be suppressed, but a centre of infection for the surrounding area will be removed. A little consideration will show that it must be difficult to produce definite figures of any value with regard to the 1906-7 season, the severity of the epidemic meant correspondingly widespread importation and, with importation going on wholesale, recrudescence must have been masked to a considerable extent, and again, the question of recrudescence, a subject too wide to be discussed here, has not been properly worked out, and we cannot state with certainty that recrudescence will or will not occur in a locality, we can only infer from probabilities that it may. In the statement at the end of the article is given a list of nineteen villages (Amritsar city is excepted) in which plague has reappeared year after year without any evidence that infection was re-imported, in the more marked instances, Bath for instance, the people themselves, in the surrounding country, recognise that plague originates annually in these spots and that it is from them that their own villages become infected. In 1905-6 rat-destruction was fully carried out in 11 of these, and in these there was no recrudescence of plague, it was partially carried out in 4 and not at all in 4, plague reappeared in all these, importation not being traced, those that were partially ratted escaping with a mild epidemic compared with those not treated. Most of these were again ratted in 1906-7 and 12 were subsequently infected, in 10 of these importation is reported to have been traced, in one, Kasel, where the Plague Research Commission was at work, importation was doubtful. With widespread importation going on, it is possible that recrudescence may have been masked, but the evidence, on the whole, is certainly favourable to rat-destruction. In many places, plague recrudesced after rat-destruction, but in these, as a rule, the measure could only be imperfectly carried out, in the Ludhiana district, for instance, where it was new to the

people. Many particular instances of success could be given, in Mukerian, a municipal town of some 4,000 inhabitants, baiting was thoroughly carried out, except in two separate blocks of houses inhabited by Jains, plague actually reappeared in both these spots and no importation could be traced.

Effect of baiting after an epidemic has begun

—The average result can be judged from the figures already given. While the mortality is very slightly diminished, the epidemic period is markedly increased, or, in other words, a longer epidemic with a milder incidence is substituted for a short, sharp one, probably because chances of contact are lessened among the diminished rat population. This average result must not be applied as an absolute rule, however, the amount of good that can be done probably depends on the number of uninfected rats left, the area of the epizootic extends considerably in advance of the epidemic and, where the latter is fairly established and the locality is small there is no advantage in carrying out a rat poisoning campaign, indeed, it is advisable not to attempt it, as the people will naturally be dissatisfied with the result and the measure discredited. In large places, however, much good may be effected by treating uninfected areas. The town of Hissai was very carefully ratted, and, when the operation was nearly completed, human plague, which had been preceded by rat mortality, was discovered in the part remaining untreated, the operation was completed and the epidemic soon died out, later in the season the disease again reappeared in the same quarter, baiting was repeated and the epidemic was again aborted. Nothing, I believe, could have saved this town from a destructive epidemic, had nothing been done.

Effect produced by ratting large areas—The attempt has been made in the province, and whole districts, Lahore, Gujranwala, Hoshiarpur, etc., have been ratted. It has not proved altogether successful, for it was impossible for the staff available to work sufficiently rapidly, and it was found impracticable, as a rule, to bait more than once, or at most twice during the plague season, long before a portion of the area had been done, rats had reappeared in places ratted first, and, in addition, plague had broken out in places that had not been reached. If a sufficiently numerous agency could be employed, and the people would co-operate and areas were ratted every six weeks or two months, I believe a district could be kept fairly free from plague, under present conditions this does not appear possible, except in limited areas.

Effect of more frequent ratting—The figures on which all these observations are based have been taken from villages which were ratted once or twice during the plague season. The favourable effect is naturally much more evident when villages are ratted more often, as the following figures show, they are taken from an area con-

taining villages, apparently under exactly similar conditions, some of which were ratted three times, the others not being treated at all

	Ratted villages	Non ratted villages
Number of villages	154	86
Number subsequently infected more than 9 deaths in each	30	84
Number subsequently infected less than 10 deaths in each	49	2
Remained free	75	0

It will be seen that half the ratted villages escaped altogether, while none of the non-ratted villages did, nearly all of the latter suffering severely. Again, the ratted villages which became infected, suffered much less than those not treated, plague incidence in the former being 5.18% and in the latter 1.14%. It is interesting to compare these figures with those given concerning areas where villages were only ratted once or twice during the plague season—

Plague incidence Areas where villages were not ratted over	5%
Plague incidence Areas where villages were ratted once or twice	3%
Plague incidence Areas where villages were ratted three times slightly over	1%

Effect in towns—The larger the town, the more difficult it is to largely reduce the rat population by poisoning operations, the reduction is comparatively less, and rats return more quickly to their original numbers than in smaller places. Campaigns were carried out in a large number of towns with varying degrees of completeness, in the majority, the operation was only done once, at the beginning of the plague season, and the only favourable result was that the epidemic was probably delayed. The results, therefore, are very discordant, and much stress cannot be laid on the figures that have been collected.

So many varying factors have to be considered, that definite instances give a more accurate idea of the value of the measure than collective figures of this sort. The first attempt at rat-destruction made in this province was first carried out in Ambala city, in the spring of 1905, it was done very thoroughly and seemed to bring a severe epidemic to an end before the period of seasonal subsidence had been reached. This campaign was repeated several times during 1905-6, and during this season only 5 cases, all imported, occurred, in 1906-7 very little was done and 1,012 lives were lost. In Jhelum town, operations were fairly persistently carried out for 18 months, plague was imported into the town on 20 separate occasions during this period, and not till May 1907 did indigenous cases occur, the epidemic including importations only costing 24 lives. In Pind Dadan Khan, a town of the Jhelum district, somewhat similarly treated as Jhelum town itself, in spite of 16 importations in 1907, the epidemic did not begin till April, which resulted in 97 deaths, in the 1903-4

season, 700 deaths occurred in this town. It may be noted that, proportionate to the population, double the number of rats were destroyed in Jhelum as compared with Pind Dadan Khan. The mild incidence in these towns was in striking contrast to the severity in other towns and villages of the same district, and importation in the latter was quickly followed by an epidemic. The Hissar towns were very carefully done, and the mortality may be fairly contrasted with that in a previous bad season, 1904-5 —

	Population	1904-5	1906-7
Hissar	18,065	829	90
Sirsa	17,058	424	80
Hansi	18,272	1,279	230
Bhiwani	37,346	1,758	638

There was, consequently, a marked diminution in the latter year in the spread of plague by importation from these centres to the surrounding district.

III—SUMMARY AND CONCLUSIONS

On account of numerous difficulties which have beset the introduction of this measure, such as lack of experience in methods, distrust of the people to anything new, and so on, its practical application has been necessarily imperfect in many respects. In spite of this, the evidence shows that rat-destruction is a procedure of great value for the prevention and mitigation of plague epidemics, and its greatest claim to consideration is that it is a preventive and can be carried out when plague is not present, because it involves so little interference with the customs and comfort of the people, that they will fairly readily permit it to be carried out. This cannot be said of our two other effective measures, evacuation and inoculation. These are of the greatest value, but years of experience have taught me that it is hopeless to expect the people generally to accept them until the epidemic has appeared and danger is imminent. One can, therefore, look upon these measures, at any rate at present, only as most valuable palliatives where plague is raging. No one will presume to deny that prevention, however difficult it may seem, is more important than mitigation, and, while not discounting the value of sanitary improvement, in which but slow progress can be made, it seems that rat-destruction is the only measure that can be applied to this end. Every effort should be made to improve and extend its application.

In towns, a permanent system of rat removal by traps should be carried on at all times as part and parcel of the ordinary sanitary routine, so equipped, staffed and supervised as to ensure that more rats are removed than can be compensated for by breeding. This system can be usefully supplemented by occasional poisoning campaigns, one especially being necessary at the beginning of the plague season, so that rats may be reduced to a minimum by poisoning,

subsequent increase being prevented by trapping. This system should be extended to dangerous villages where plague is considered likely to be endemic.

By this means the more dangerous diffusion centres for plague and those places where recrudescence is more likely to occur, will be rendered more or less immune to plague epidemics, imported infection will be less likely to gain a footing, and, where epidemics occur, they will be less severe than they otherwise would be and consequently less likely to spread infection to other localities. The institution of this system has another manifest advantage, and that is, that when signs of infection appear, the traps can be concentrated in the infected area of a town, or in a village, and the subsequent spread of the epidemic very possibly prevented.

Where trapping cannot be carried out, the poisoning method of rat-destruction which can be very rapidly carried out, although its effects are only temporary, can be used with great benefit for the following objects:—(1) To render a town or village, or collection of these, more or less immune to epidemics for a certain period

of time, the period of immunity being prolonged by repetition of the operation, for this object baiting every six weeks or two months is recommended throughout the plague active season. (2) To render the uninfected part of a town, which has become infected in one quarter, less liable to the spread of infection. (3) To prevent recrudescence in places where it seems likely that this may occur. (4) To surround an infected village with a cordon of baited villages and so prevent the spread of infection to them. (5) To protect a healthy village in the midst of an infected area.

It is inadvisable to rat a town by poison when an epidemic is at all widespread or where it is well stated in the smaller villages, for the rat epizootic is usually in advance of the epidemic.

Finally, the system of trapping advised should not be confined to towns in or near infected areas. It should be extended to every town in uninfected districts that is likely to be an important centre for diffusing plague infection, should the disease be introduced, it should form an important part of all urban sanitary procedure.

Effect of rat-destruction carried out in villages annually attacked by plague (usually recrudescence)

Name of town or village	Population	PLAGUE DEATHS						RATTED OR NOT		REMARKS
		1901 2	1902 3	1903 4	1904 5	1905 6	1906 7	1905 6	1906 7	
Fatehpur	1,299		114	74	89	<i>Nil</i>	3	Fully	Fully	Importation
Bhomi	1,645		62	122	82	85	<i>Nil</i>	None	Do	
Ibbin Khurd	547		103	18	27	2	23	Partial	None	A Jam village. No details.
Majitha	6,490		253	206	86	30	110	Fully	Partial	At the second baiting in 1907 some Hindus refused importation.
Taipa	1,525		107	84	67	<i>Nil</i>	<i>Nil</i>	Do	Fully	
Sathyala	4,027		256	207	124	188	23	None	Do	Very small amount done in 1905.
Bath	2,107		297	219	251	3	<i>Nil</i>	Fully	Do	Importation
Tain Taran	4,428		87	33	52	2	14	Do	Do	
Nurpur	416		27	22	32	<i>Nil</i>	<i>Nil</i>	Do	Do	
Kamalpuri	1,514		33	67	51	87	<i>Nil</i>	None	Do	
Mallawal	783		56	133	110	<i>Nil</i>	<i>Nil</i>	Fully	Do	
Bussah	1,229		47	77	139	<i>Nil</i>	12	Do	Do	Importation
Gandiwind	2,440		37	47	263	<i>Nil</i>	3	Do	Do	Ditto
Kasul	4,161		197	140	209	96	55	Partial	Partial	Trapped by Captain Gloster.
Sohal	4,010		218	123	157					doubtful importation.
Kot Khura	1,107		48	58	83	<i>Nil</i>	22	Do	Fully	Importation
Mahsumpura	1,086		26	47	159	33	6	Fully	Do	Ditto
Jandiala	7,877		167	227	133	135	21	Do	Do	Ditto
Chachawal	1,500		46	88	57	30	53	None	Do	Ditto
Amritsar City	162,429		373	1,052	1,145	1,929	<i>Nil</i>	Partial	Do	
							1,023	None	Partial	

FURTHER OBSERVATIONS ON THE FLEA-KILLING POWER OF CERTAIN CHEMICALS

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I HAD hoped at the time of submitting my report to the Government of Burma on the subject of Flea-Killing with special reference to anti-plague measures, a copy of which was published in the *Indian Medical Gazette* for

July 1907, to have finished testing the germicidal power of the various Petrol and other emulsions which I had found most efficacious against fleas, but I had been unavoidably prevented from carrying out my intentions until very lately.

It must have been observed from my report that the chemicals which were found to be efficacious against fleas were (1) SO_2 , (2) Petrol and Benzene, (3) Phenyle, and to this list I wish now to add one more, viz, Izo-Izal. This will be dealt with later on. It will be seen that I have placed SO_2 at the head of the list as a

result of laboratory tests. Experiments to test the practical applicability of this gas were undertaken, which will be described in detail separately later on.

The superiority of results obtained by Petrol and Benzine emulsions must have struck all those who read my report, and consequently these have been the subject of comment by medical men and others working on the same subject, chiefly by Dr Hossack of Calcutta, Dr D Sommerville of King's College, London, and Mr W Blyth. Dr W C Hossack, while corroborating my results with Phenyle-Petrol, has not been successful with Cyllin-Petrol. Dr D Sommerville of King's College has found this to successfully kill rat and dog fleas in 1 in 800 dilution. Mr W Blyth, on the other hand, while finding Petrol and Benzine as "good" pulicides (and I take it also when emulsified, although no mention is made of this fact by him), has found that the germicidal power of Cyllin is destroyed owing to the presence of free oil in Cyllin-Petrol emulsion. On the whole, therefore, while the pulicidal power of Petrol and Benzine is recognized by Dr Sommerville and Mr W Blyth, the chief pulicidal element in Phenyle-Petrol is attributed to the presence of Phenyle by Dr Hossack. Again, while Dr D Sommerville had found the Rideal-Walker co-efficient of Cyllin-Petrol to be 10.5 and Cyllin-Benzole to be 11.5 as against 17 of Cyllin alone, Mr Winter Blyth considers this emulsion to have no germicidal power at all. As regards the pulicidal powers of these various emulsions, I only wish to add that I have tried these over and over again, and though perhaps results have not always been quite uniform, I have always found them to be most efficacious, in fact, superior to anything else I have worked with. Of the two, *viz*, Phenyle and Cyllin, I have found Phenyle with Petrol to be a more powerful pulicide, as will be evident from my results recorded in Table II of my previous articles. The germicidal power of this is said to be 1.5 by Dr Sommerville. The germicidal power of the Cyllin-Petrol emulsion I have tested after the method of Professor Klein which is briefly as follows—

A 48-hour broth culture of the *Bacillus Pestis*, obtained from the spleen of a guinea-pig which had died 72 hours after receiving a subcutaneous inoculation of a culture obtained from the bubo of a human plague case, was used in these experiments. Necessary dilutions of the emulsion were made in sterile test tubes and to 5 cc of each 0.5 cc of the plague culture was added. After intervals of 5, 10 and 15 minutes, 3 loops on agar and 5 in broth were inoculated, a control being made at the same time and the tubes incubated at 37° C. They were inspected regularly every day for 10 to 15 days. As a result of these experiments, I have found that Cyllin-Petrol up to $\frac{1}{400}$ in 5 and $\frac{1}{800}$ in 10 minutes stopped all growth of the *Bacillus Pestis*.

In a second series carried out similarly with a 24 hour subculture of *Bacillus Typhosus* it was observed that $\frac{1}{400}$ Cyllin-Petrol emulsion arrested all growth in 5 minutes, but was ineffectual in $\frac{1}{800}$ dilution, although the number of colonies was markedly lessened.

My observations, therefore, while not giving the exact germicidal power of these emulsions, at least show that the germicidal power of Cyllin in combination with Petrol or Benzine is not entirely destroyed, as said by Mr W Blyth. Dr D Sommerville has worked out the Rideal-Walker co-efficient of Cyllin-Petrol (50 per cent of each) to be 10.5, and I think that the observations made by us should dispel all doubts on the subject.

Sulphur Dioxide, dry without any moisture, was found by me to be most efficacious against fleas, killing them when treated in a closed space, a test tube for example, in 30 to 45 seconds, and as this gas is also fatal to rats, the germicidal powers having been long known, the Sanitary Commissioner, Burma, desired to ascertain the practicability of using this gas in the case of Burmese houses which are usually made of wood or matting and have innumerable cracks and crevices. Consequently, under his orders, a Committee, of which I was a member, was appointed to test the practical utility of SO_2 as obtained by Clayton's machine Type H on Burmese houses. It was anticipated that with a single application of this gas, rats, fleas, plague bacilli and other objectionable vermin would be destroyed without in any way disturbing the furniture of the house. Experiments were carried out as follows—An isolated building was chosen for the experiment—3 feet deep trenches were dug right round and corrugated iron sheets sunk in so as to form a complete barrier to all the rats inside the building. Evacuation was then carried out through a small opening in the fence and strict watch kept so that none of the rats escaped. The chinks and crevices were then pasted up with paper as far as was possible, and in the case of houses built on wooden posts off the ground, the underneath was enclosed by means of corrugated iron sheets, blankets, gunnies, etc. The delivery tube of the apparatus was then introduced in the middle of the building on the floor and the suction pipe arranged at a convenient spot near the roof. Fumigation was then started and kept up for from four to eight hours. The percentage of SO_2 in the delivery and suction pipes was tested at intervals, and it was observed that when the apparatus was properly working, 10 to 18 per cent in the delivery and 3 to 5 per cent in the suction tube was obtained. During the fumigation, coolies with sticks were posted outside the building (but inside the corrugated iron fence) to watch for and kill all rats escaping from the building. At the close of the operation, the building was aired and a search made for dead bodies, and out of one

experiment, 13 lizards, several cockroaches, 2* rats and other vermin were collected. A control experiment was carried out by placing a cage containing 12 rats inside the building during fumigation for five minutes when they were all found to have died. The Committee, however, after a fair trial, came to the conclusion that absolute sealing, which was essential for SO_2 in order to maintain a sufficient percentage of gas inside the building, was not possible in the case of Burmese houses, and hence the power of diffusion of the gas was unreliable, and that though it would prove of great benefit in the case of houses which could be properly sealed, the method was unsuited for Burmese houses. The cost of treating a single house was something like Rs 100.

While on this subject, I wish to say that the method of barricading a house and treating it with rat-poison, SO_2 and all other methods which could destroy each and every rat inside, would appear to be of great benefit in destroying or at least limiting the source of infection, if it be known at the commencement of an epidemic and thus prevent the spread of infection by rats which could all be accounted for in the closed barrier.

Izo-Izal—Through the courtesy of Messrs Newton Chambers & Co, manufacturers, through their local agents, a sample was received by me for experimental purposes in December 1907. According to my "Submersion" method it killed fleas in one per cent strength in about 1 minute when they were all submerged, when tried in $\frac{1}{100}$ dilution the results were also good, but in $\frac{1}{1000}$ it took 70 seconds to kill two fleas out of every five, and the action appeared to me to be doubtful, so that I reported to the Sanitary Commissioner, Burma, that, in my opinion, 1 per cent was the weakest strength to employ for practical disinfection. The cost of the stuff is Rs 4 per gallon, consequently 500 gallons of a 1 per cent strength would cost Rs 20 as against Rs 2.2 for a $\frac{1}{1000}$ Phenyle-Petrol and Rs 2.13 for a $\frac{1}{1000}$ Cyllin-Petrol emulsion for every 500 gallons.

Mr W Blyth, in his article on "Fleas and Disinfections" in the March number of the *Indian Medical Gazette*, considers my "Submersion" method to have been more unfavourable to the flea, and considers his method described there to be a better one. I have no desire to dispute this point. Having worked with it so far, I have stuck to my own method and as a preliminary or "first test" I always use it, if it is unfavourable to the flea with any particular chemical, it must be so in the case of water controls and other chemicals, so that from a practical point of view, if all chemicals are treated under the same conditions, no matter

what, I think the result can be fairly taken to give a pretty accurate idea of their comparative action. The actual pulicidal action, as probably takes place in actual practice, cannot, however, be gauged by laboratory experiments alone, no matter how carried out. These can and are only expected to show which of the various chemicals tried appear to be most satisfactory. After passing the "first test," a chemical is further subjected to other tests, viz, "washing dogs," "box experiments," spreading a thin layer of the fluid on a board and dropping fleas on to it under a Petri dish. In this last case, the layer of the fluid is about the thickness of a foolscap paper, and consequently I think this test is still more difficult to pass than Mr W Blyth's method where he uses about $\frac{1}{2}$ -inch layer of fluid. When tested in this way, a 1% dilution of Izo-Izal took three minutes as against one minute in the case of Cyllin-Petrol of a similar strength.

Allusion has also been made to my using dog fleas. I have two reasons for preferring them to rat fleas (although in no case do I leave confirmation on rat fleas untied). Firstly, they can be collected in any number whenever required, whereas rat fleas are always very hard to get, at least, so has been my experience in Burma and, secondly, as they can be collected without the aid of chloroform, so absolutely necessary in the case of rat fleas, they are, in my opinion, in a better condition to be tested upon and not open to such individual variations as fleas recovering from chloroform show. To get over this, Dr Hossack uses fleas removed and kept in test tubes for 24 hours. I find that about 60 to 70 of the fleas collected die within the first twelve hours and he has also observed a similar difficulty. In the *Indian Medical Gazette* for October 1907, he says "only 97 fleas were alive at the end of 24 hours out of 252." I consider that dog fleas freshly caught are much more in a natural condition than either freshly chloroform-caught rat fleas or the small percentage that have survived their comrades at the end of 24 hours.

As regards the difference, so far as pulicides are concerned, not only do I consider but have actually never discovered any appreciable difference in the behaviour of the two fleas, viz, the *Pulex Cheopis* and the *Pulex Felis*.

In the October number of the *Indian Medical Gazette*, Dr Hossack draws attention to a few difficulties and sources of error met with. I have met with similar difficulties, and the way I have tried to eliminate as much error as was possible, might perhaps be of interest. Firstly, as regards the individual behaviour of fleas. For reasons given above, I have largely used dog fleas (i.e., fleas collected from dogs but not classified) which, in my opinion, can be experimented upon in a more natural condition than rat fleas collected with the aid of chloroform and either used directly after return of activity or after keeping for some time

* The small number of rats killed is not to be attributed to any want of killing power on the part of the gas, but to the few rats present in the building.

Secondly, to eliminate error arising from discrepancies in individual experiments, I usually perform a few preliminary tests without recording them before a systematic examination is undertaken, and at the end, add up the number of experiments and fleas used, and then work out a percentage which, I think, might fairly be taken to indicate average results.

Conclusions and Summary

1 There are many sources of error met with, and these can only be eliminated by experimenting on fleas collected without the aid of chloroform, so as to be as healthy and active as possible.

2 As large a number of fleas as possible (at least five) should be used for each experiment, and after the experiments have been repeated several times, the results should be added together and worked out as a percentage, so as to serve as a comparative statement.

3 Laboratory experiments, no matter how carried out, can, at the very best, only indicate comparative pulicidal power of the various chemicals tried, the actual power that would be exerted when houses are treated, can only be presumed from these results.

4 A suitable strength to employ for practical work of any stuff, appears to be double the one found efficacious by laboratory tests.

5 Petrol and Benzine are most efficacious against fleas, but owing to their high inflammability, cannot be used in their pure form. They are easily and cheaply emulsified by equal parts of either Cyllin or Phenyle, and thus, while still retaining their pulicidal power, are rendered absolutely safe as an application to houses. These not only combine their own pulicidal power with Petrol, but Cyllin also preserves its germicidal power, thus producing an emulsion combining pulicidal with germicidal properties. In one Phenyle-Petrol appears to have a slightly better pulicidal action than Cyllin-Petrol. Benzine combinations appear to me to be slightly better than Petrol combinations.

6 The cost of these emulsions, according to the prices prevailing in Rangoon at the present time, is Rs 2-2 for Phenyle-Petrol and Rs 2-13 for Cyllin-Petrol for every 500 gallons of a $\frac{1}{100}$ strength, which I consider as most suitable for practical purposes.

7 Izo-Izal up to 2% strength is efficacious against fleas by laboratory tests. Therefore, a suitable strength to employ practically would appear to be at least 1%. It has both pulicidal and germicidal properties. The cost per 500 gallons of a 1% dilution is Rs 20. In my opinion, in spite of its high cost, it does not present any special points in its favour over the Petrol emulsions which are cheap and equally good. Izo-Izal flashes at 78-79° Fah.

8 SO_2 though very efficacious against fleas, rats and bacteria, cannot be suitably adopted for house disinfection in such a thorough manner as it can in the case of ships. The method

described above commends itself for trial as a means of eradicating the source of infection, if known, at the commencement of an epidemic.

9 The flash point is inversely related to the pulicidal power. The lower the flash point, the stronger the flea-killing power and *vice versa*. In my previous report I recommended that the emulsions should be used fresh, as they get weaker by exposure. Attention to this fact has also been drawn by Dr Hossack in his article in the October number, where he says that the pulicidal element is either volatile or unstable. I consider it to be volatile, and the more of this volatile stuff there is, the stronger is the pulicidal power of the chemical. Petrol and Benzine, both powerful pulicides, being extremely volatile, are thus, in my opinion, responsible for the superior Cyllin (and Phenyle) Petrol (and Benzine) emulsions. The pulicidal element in Izo-Izal also appears to be some volatile oil, as the sample tested by me flashed at 78-79° Fah, and would, therefore, appear to correspond probably to some Paraffine oil flashing at that temperature, or might perhaps be due to a small quantity of Petrol or Benzine in it—a quantity which, while unable to lower the flash point below 78° Fah, gives it a distinct pulicidal effect. As a result of actual experimentation, I have determined the following flash points of Cyllin with Petrol in the following proportions—

Petrol 1-2% flash point 141° Fah
1% flash point 106° Fah
2% flash point 72° Fah
50% under 50° Fah

10 The death of the flea is brought about by asphyxiation due to the presence of a volatile element in the stuff applied and is not due to any chemical, irritant or any other effect, SO_2 as dry gas kills fleas in 30 to 45 seconds, but H_2SO_4 even in 1 in 250 was found to be absolutely useless. This being so, it follows that death would result in a comparatively shorter time when fleas are submerged than when they are floating on the surface of the fluid.

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ENQUIRIES REGARDING THE MODE OF SPREAD AND THE PREVENTION OF PLAGUE

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It is probable that there will be little if any difference of opinion regarding the first six questions, so I

shall deal with them very briefly and go on to what I consider is a much more important matter from a prevention point of view, viz., the keeping of cats. I have had opportunities of making enquiries regarding the mode of spread of plague in a large number of villages, and it is always the rule that rats die before the epidemic begins, that the greater the number of rats, the more severe, as a rule, is the epidemic, that where an epidemic starts in March or April there is a lull during the hot months, and then the disease starts again (this observation of Browning Smith is one of great practical importance), that you can tell in what part of a town the disease will spread and what parts will be free by enquiring carefully in regard to the presence of rats, and that in the smaller towns and villages a year of plague is usually followed by an interval of two years' freedom.

Hindus look on the rat as the "Sowari" (means of locomotion) of the God Ganpati, and a large proportion of them are on this account not willing to join in a rat destruction campaign, but it is a very important fact that the great majority of these Hindus are quite willing to keep cats, and if by keeping cats we can keep down the number of rats, then why ask those Hindus to do a thing which is so much against their religion? Many Jains and Marwaris catch rats and let them go in the fields, and as a great number of Jains object even to keeping cats, I admit that the Jains present a difficulty. They are, however, in very small numbers in most towns, and they are rarely to be found in the villages in this part of the country.

In a paper which was published in the *Indian Medical Gazette* last year I gave the results of a Cat Census in Amraoti District, and showed that where cats were numerous no plague occurred. During the past plague season there have been epidemics in 54 towns and villages in Amraoti District, and investigations have been made in nearly all of these to find how far the presence or absence of plague could be accounted for by the absence or presence of cats. The investigations were made by Assistant Surgeons, Hospital Assistants, Tahsildars, Patwaris, Police, Vaccinators and others and a fair proportion of the results were verified by myself in a general way. A large pile of reports has been the result, and it would be quite impossible to give even a brief outline of all of these in a short paper. It is, however, perfectly clear from a perusal of them that the keeping of cats is the method of preventing plague, and the arguments in favour of this view might be summarised as follows—

(a) There were many rats in my own bungalow, but since cats have been kept a rat is rarely seen.

(b) Occasionally I have brought some rats from the town and let them go in a room with the cats, and in a very few minutes they are destroyed by the cats.

(c) I have asked a very large number of people whether the Indian cat is a good rat destroyer, and the usual answer is "How can a rat live in a house with a cat?"

(d) In villages where the cat percentage is high, there has been no plague, while in adjacent villages where the cat percentage is low, plague has prevailed. Hospital Assistant Shian Behari gives numerous instances like the following. A, B and C are three villages plague has occurred in A and C but not in B, which lies between the other two, and it has been found that the percentage of cats has been higher in B than in the other two. Hospital Assistant Azimuddin gives as an instance the village of Dhaba where plague was prevalent. One block of houses was free from plague (19 houses with 9 cats), while plague prevailed in the rest of the village in which the cat percentage was low. He mentions the names of six adjacent villages in which there was no plague, and in these the cat percentage varied from 32 to 75. Hospital Assistant Paranjpe mentions four villages in which plague occurred, and in the centre of the area occupied by these villages is another village which was free. The

cat percentage was higher in this last village than in any of the others. The Patwari (Native Surveyor) of Asegaon has four villages in his charge, and in only one of these did plague occur. The percentage of cats was low in this village, while it was over 50 in the other three.

(e) Then, there is what may be called the mohulla argument. It usually happens that the people of one caste live together in one group of houses (mohulla), and as some castes, for example, the Mahomedans, are more keen on keeping cats than others, it will be found that while plague is spreading through a village, the people of the caste who keep cats are free from plague. For example, in the Mahomedan mohulla of Kasatpura in Ellichpur City Dr. Holmes and the Municipal Secretary reported that this part of the city almost entirely escaped. At Pusla (a village with a population of about 5,000) a Hindu asked why it was that the Mahomedans, although they did not evacuate their houses, escaped from plague. Many other similar instances might be mentioned.

(f) Then, it is very common to find that a house where a cat was kept escaped from plague although the epidemic was prevalent in the neighbourhood. Cases of indigenous plague will practically never occur in a house where there are three cats. If, however, a cat is kept in a house in the middle of an area in which the people generally do not keep cats, plague may occur in such a house. For example, we had plague recently in Amraoti city, and for the third time it began in the area which is occupied by the Jains who do not keep cats. Two cases of plague occurred in the house of a Mahomedan who lives in this area although he has kept two cats.

(g) It is very common to find that people had of their own accord begun to keep cats as soon as they began to suspect that rats had something to do with plague epidemics. The keeping of cats is *par excellence* the people's own method of preventing plague, we know that they objected to almost every other method that had been proposed, and the fact that the people take to keeping cats so readily and willingly is surely a very strong argument in its favor.

(h) Where many buffaloes are kept, cats are almost certain to be found in considerable numbers, as they are attracted by the milk, and the village with many buffaloes is usually free from plague. In Saur, while plague was severe among the Bhowani Dhers, the mallies who kept buffaloes and had several cats escaped completely, although they did not leave the village. The Bhowani Dher is not allowed to keep cats, as the death of a cat or the birth of kittens in his house puts him out of caste. Many of these Bhowani Dhers live in wattle huts, and while they live in such huts, they are free from plague because rats do not usually abound in huts of this kind, but when they live in the mud walled hut, they suffer severely, because the mud wall is the favourite home of the black rat. The Bhowani Dhers are mostly immigrants in this district, and at first they usually live in wattle huts not actually in, but by the side of, a village. Later on they may build mud walled huts. As they do not keep cats, I expected that when plague occurred in a village, they would suffer severely, but very often they were remarkably free from plague, and it puzzled me for some time until I noticed that those who live in the wattle huts generally escape, while those who live in the mud walled huts are very liable to get plague. In Malkapur eight Bhowani Dhers died in one house from plague, while many Mahomedans were living less than a hundred yards away and were quite free from plague. A few of the Bhowani Dhers now keep male cats, thus avoiding the penalty that is incurred by the birth of kittens.

The religious aspect of the question of keeping cats is unfortunately one that has been little studied. There are many references to the cat in the religious books of the Mahomedans as the story of Abbo-Hurrah (Father or Protector of Cats) and the story of Noah and the Ark—cats being specially created to destroy the rats.

which had been created from the pig, and which were eating holes in the Ark, so that the lives of all on board were in danger. Since attention has been drawn to these points, it is the exception in this district to find a Mahomedan who has not a cat in his house. The Hindu is forbidden to kill a cat, and any Hindu who kills a cat must have a golden cat made which he will either present at a shrine at Benares or wear hung round his neck. It is a remarkable, as well as a very important, fact that the cat is the only animal that is specially protected by both Mahomedans and Hindus, and it is also astonishing to find how very widely these religious ideas are known among both these classes. By the by it is a great pity that the members of the recent Plague Commission did not make some experiments on the cat as a rat destroyer. Neither the members of the Plague Commission nor Professor Haffkine in his recent lecture on the "Present Methods of Combating Plague" have, as far as I have seen, said a word about the cat. One member of the Commission gives a whole page of figures to show that, in spite of vigorous efforts for a whole year, the number of rats could not be considerably reduced by traps. He does not tell us whether there was one cat or fifty, but I can assure him that his whole argument would be completely upset if a few cats were introduced. The same member of the Commission states that no more efficient rat destroyer than plague itself has been discovered. It is true that plague makes a sudden and big sweep of the rats, but the swarms of rats will return within a few years, whereas where cats are kept in sufficient numbers the swarms of rats will not again be found, and therefore the cat is infinitely more effective in keeping down the number of rats. After an epidemic of plague the rats have nearly all disappeared, and there is freedom from plague for a considerable period in the smaller towns and villages. Cats keep down the number of rats permanently and therefore prolong that period indefinitely. Every villager in this country knows that the cat is the natural enemy of the rat. The Plague Commission have proved beyond the slightest doubt that rats are the cause of plague epidemics, but, as I have said, it is a pity that their instructions did not allow them to take up the prevention of the disease.

Coming now to the question of inoculation—as long as we did not know how plague was spread, and, as long as we were under the impression that large numbers of rats could not be kept from collecting in a village or town, there was a good deal to be said in favour of inoculation, but the position has now been changed. We know that rats are the cause of plague, that we have only to regulate the balance between cats and rats, and plague must stop, and that as soon as the people fully realise that rats bring plague, they will of their own accord regulate that balance for themselves. Those who are in favour of inoculation might be divided into two groups. Professor Haffkine seems to think that we shall never get rid of plague until we go in for universal inoculation, but this view could never be held by anyone who has studied the customs of the people in regard to cats and who has realised how the keeping of cats fits in with the religious ideas of the people, how willingly they take to keeping cats, and how effective the cat is as a rat destroyer. Others recommend inoculation as a temporary expedient. If it is necessary for a man to go into a plague infected area, then I should advise him to be inoculated, but as a temporary expedient, we have no better measure than evacuation and it comes to this. Are we to recommend people to adopt what even its strongest supporters admit to be an imperfect protection when we can advise them to adopt evacuation which we know to be a certain means of protection? In the house of the Manager of the Diamond Press in Amritsar one woman was inoculated and she was the only person in the house who died from plague because all the others went out. I think, then, that it would be a very unwise policy to recommend inoculation in

preference to evacuation. One member of the Plague Commission recommends that no single anti-plague measure should be adopted to the exclusion of others, but he himself omits the best of all, viz., the keeping of cats. Remember the fable about the fox and the cat and the lesson to be learned from it, viz., that one good trick is worth ten bad ones. The more attention we give to inoculation, the less we are certain to give to the only sound commonsense method of preventing plague, viz., the keeping of the natural enemy of the animal that is responsible for spreading the disease.

ENTERIC FEVER IN THE NATIVE ARMY

By G. S. THOMSON, M.B.,

MAJOR, I.M.S.,

CASE I

G. H., age 41, service 22 years, Mahomedan, station Poonah, was admitted to hospital on 27th July 1906, suffering from dysenteric symptoms. Previous health good. There was no rise of temperature, but he had lost appetite, looked emaciated, and the stools contained some blood and slime. He was put on salol and his diet was restricted to milk and farinaceous food. In about a week's time the dysenteric symptoms disappeared, but a little later, on 13th August, the eighteenth day after admission to hospital, he had fever, evening temp 102°. He was isolated and his stools disinfected.

15th August.—An examination of the blood for malarial parasites gave a negative result. The sputum was examined for tubercle bacilli, but also with a negative result. As the case looked auspicious, the blood serum was examined and gave a negative Widal with bacillus typhosus in 1-40 dilution. To exclude the possibility of malaria, five grains of quinine were administered hypodermically and Liquor Arsenicalis prescribed in mixture.

28th August.—This is the sixteenth day of the fever. The temperature is now irregularly intermittent in type. The blood serum was again sent to Western Command Laboratory and the report received was—"Negative Widal in 1-40 dilution with B. typhosus."

6th September.—He has had repeated injections of quinine, but the temperature rises irregularly. Yesterday evening there was a sharp rise to 102°. There are no general or special symptoms to account for the fever. A specimen of blood and urine were sent to-day to the Parel Laboratory, Bombay, and the following report obtained from the Director in charge: "Widal test negative to B. typhosus, positive to B. paratyphosus being marked in 1-20 dilution, distinct in 1-50 dilution, a mere trace in 1-100 dilution."

24th September.—The temperature now sometimes reaches 100° in the evening. The general condition is improving. Convalescence is established. Remarks.—At no period of the disease was there any delirium, typhoid stools, roseolar spots, epistaxis, pneumonia, bronchitis, or thrombosis. Careful enquiry failed to discover contact with any enteric patient. There were no enteric cases in the hospital at the time, nor any in the regimental lines where he lived. Nor was there any insanitary condition in the precincts to account for the illness. Total strength of Regiment 1,387. Duration of fever 42 days. The patient made a good recovery. He was a meat eater and lived well, being well paid as a Farrier Major in the Regiment.

CASE II

P. B., age 11, daughter of a musician in the regimental Band, Mahratta caste, station Poonah, was admitted and isolated in hospital on 16th August 1906, for fever with headache, constipation, giddiness and loss of appetite. Morning temperature 104°. The

tongue was slightly furied on the dorsum, no rashes present. Abdomen is hot, but there is no fullness anywhere, nor any evidence of pain or tenderness. According to the history given by the father of the child, she had got wet in heavy rain some ten days previously, and she had some fever in the lines for over a week previous to admission. Date of onset of fever 5th August, previous to which she was in good health. The invasion therefore was distinctly gradual as in true typhoid, and quite unlike what is usually noticed in malarial fevers.

17th August—An examination of the blood for malarial parasites gave a negative result. To exclude, however, all possibility of malarial infection, she was put on quinine with diaphoretic mixture. Evening temperature 104.4°. She was ordered yesterday cold bath, ice poultice to chest and abdomen. Temperature fell to 97° without any unpleasant effects. She had delirium yesterday with the high fever before the cold bath.

20th August—Morning temperature 103.4°. The fever is high and persistent, ordered two grains of quinine hypodermically, with a general expectant treatment. No diarrhoea or roseolar spots. One or two motions seen personally were not typhoid in character. The spleen is normal in size. This is the 14th day of the disease, and the absence of any special or general symptoms is remarkable.

22nd August—The blood was sent for Widal's test to the Western Command Laboratory. The reaction was strongly positive, but no B typhosus could be isolated.

27th August—Twenty first day of disease, yesterday evening the temperature rose to 104°. No fresh signs or symptoms to account for the fever. The following report was obtained to day from the Parel Laboratory, Bombay—"Serum of Pitoobai gave reaction to paratyphoid 1-10 and 1-20, complete 1-50 and 1-100 marked. The urine was placed on Convadi Drigalski medium and bile salt sugar, but no paratyphoid bacilli could be recovered. Abundance of B coli present—(Sd) W Baunerman.

14th November—The patient has made a good recovery. Duration of fever 22 days, there was no epidemic of typhoid in the station or in the regiment where the case occurred. Sporadic case. Total strength of Regiment, 894. There was no evidence of infection through drinking-water or milk. Sick in hospital at the time 4, none with fever. At no period of the disease was there any epistaxis, diarrhoea, spots, pneumonia, bronchitis or thrombosis. The whole clinical syndrome, in short, was negative with the exception of delirium and a gradual invasion. The temperature chart is given below with the charts of the other cases. The case appears to be one of mixed infection. The serum was more sensitive to B paratyphosus than to B typhosus, but no organisms were ever isolated in this case.

CASE III

S K, age 26, service 8 years, Maharatta caste, station Poona, was admitted to hospital for fever on the 10th July 1905. Date of onset 7th July, invasion gradual, previous health good.

11th July—An examination of the blood for malarial parasites yesterday and again to day gave negative results, morning temperature 104.6°. No special symptoms present. To exclude possibility of malarial infection he was ordered 10 grains of quinine hypodermically. Temperature fell to 100° within 48 hours, but it went up again in spite of a repeated dose of quinine hypodermically. Ordered ice bath.

14th July—Morning temperature nearly 102°. The case looks serious. Fever is high and persistent. There is much thirst, perspiration, suffused countenance, great prostration, pulse small, 108. There is no delirium, diarrhoea or rose spots.

18th July—Temperature still keeps high. Morning temperature 101°. Widal reaction with B typhosus is negative. General condition fair. No fresh signs or symptoms. Treatment expectant.

21st July—The Widal reaction was again negative to day. Temperature now ranges between 100° and 102°. This is about the 18th day of the disease. There is no diarrhoea nor any other abdominal symptoms. The spleen is normal in size. Mental faculties normal. No epistaxis, melaena or thrombosis. No lung complications. In short, the clinical syndrome is negative still.

2nd August—The temperature has fallen to normal for the last two or three days. Convalescence is established. Duration of fever 24 days. Result—Recovery. The blood was never tested for paratyphoid, nor was any attempt made to isolate the causative factor or factors from the blood, urine or faeces. He was sent on sick leave to regain his general health and on his return after some two months his blood once gave a positive Widal in 1-80 dilution within 15 minutes, but though repeatedly tested since it was always negative. Case sporadic. No case of enteric or paratyphoid in the regiment. Disease not epidemic in the station. No apparent cause like infected water, milk or food. Strength of regiment, 1,049. Only 10 cases sick in hospital, three being acute. No other case of fever in the hospital or lines. The temperature chart of the case is given below with the charts of the other cases.

CASE IV

G S, age 33, service 13 years, Maharatta caste, station Poona, was admitted to hospital for fever and cough on 3rd September 1907. Morning temperature 100.4°. Evening temperature 102.2°. Pulse 96, regular respirations 19 per minute, some loud rouch and mucous rales were audible on both sides of the chest. Previous history good.

5th September—An examination of the blood was made yesterday for malarial parasites with a negative result. To exclude the possibility of malarial infection, he was, however, put on the quinine treatment and received fifty grains of quinine by the mouth in 48 hours, the doses being of ten grains each.

9th September—The temperature is keeping high ranging between 102° and 105°. This is the seventh day of disease. Quinine has been stopped since yesterday, it having no specific effect, while the condition of the pulse does not warrant its continuance. Treatment expectant. The sputum was examined yesterday for pneumococcus with a negative result. A specimen of blood was taken by Colonel Meek, R.A.M.C., and Captain Harvey, R.A.M.C., direct from the median basilic vein under the usual aseptic precautions on the 7th instant for examination at the Government Laboratory, Poona. The report received was as follows—"Positive Widal to B typhosus in 1-40 to 1-100 dilution negative to B paratyphosus A & B. The B typhosus could not be isolated and identified from the blood, but was found several times in pure cultures in the patient's faeces, none in the urine."

20th September—The temperature has now been normal for 48 hours. General condition favourable. At no period of the disease were any of the usual classical symptoms of typhoid present in the case, with the exception of some delirium during the early stage. Result—Recovery. Duration of fever 17 days. There were two other cases in hospital of the same nature between 3rd September and 3rd November, a period of two months. The patient was a meat-eater. There did not appear to be any common causal connection between the cases. Total strength of regiment 971. The temperature chart which is nearly typical of genuine typhoid is given below with the charts of the other cases.

The following two cases occurred in an adjoining station and are published by permission of the medical officer in charge, they being very similar in their general characters to the cases recorded above.

CASE V

F D was admitted to hospital for fever on 30th September 1907. *History*—The invasion was sudden and sharp. Previous health good. Age 21. Service 2 years. Caste Mahomedan. An examination of the blood for malarial parasites on the day of admission gave a negative result. He received, however, 30 grains of quinine on three successive days, viz., 1st, 2nd, 3rd October, 10 grains each dose, total quinine taken being equivalent to 90 grains. As the fever failed to react to the quinine treatment, and was distinctly of a continued type, some serum was taken from a blistered surface under the usual aseptic precautions and sent to the Government Laboratory for report which was as follows—

Report I—"The serum gave a positive and complete Widal reaction to B typhosus in 1—20 dilution, traces in 1—40 dilution. Please send the serum again after a few days' time."

Report II—"The serum of sapper F D gave on further observation in the sedimentation tubes a complete reaction to B typhosus in 1—20 and 1—30 dilutions, distinct in 1—40 dilution, a trace in 1—100 dilution."

Report III—"On 10th instant this man's serum gave a complete reaction to B typhosus in 1—20 and 1—30 dilutions, almost complete in 1—40 dilution, distinct in 1—100 dilution, negative to B paratyphosus A & B."

Clinical notes—Case sporadic. The last case of enteric fever reported in the same regiment took place some four months ago. No history of infection through drinking water, milk or any other source. The patient is a man of regular and steady habits and has not been away from his lines, or partaken of any food or drink outside the lines. Specific typhoid eruption absent. No diarrhoea, nor any special abdominal symptoms. On the contrary, constipation was a noticeable feature of the case throughout the illness and had to be relieved occasionally by saline and other purgatives. The mental condition was always normal. At no period was there any drowsiness or delirium. The liver and spleen were normal. No headache. In a word, the clinical evidence in the case has been strongly negative in character. Result—Recovery. Duration of fever 17 days. He was a meat eater. No attempt was made to isolate the specific bacillus from the blood urine or faeces. The temperature is atypical and is given below with the other charts.

CASE VI

S S was admitted to hospital for fever on 2nd October 1907. *History*—The invasion was gradual. He had fever in the lines for some three or four days before admission to hospital, previous to which he was in good health. Age 20. Service 1 year. Caste Sikh.

An examination of the blood for malarial parasites gave a negative result. Quinine, however, was administered as usual. He took 90 grains of quinine in three days. As the fever failed to react and was of a continued type, some serum was sent to the Government Laboratory and the following reports obtained—

Report I—"This serum gave a complete reaction to B typhosus in 1—40 dilution, negative to B paratyphosus A and positive to B paratyphosus B in 1—40 dilution."

Report II—"On this first occasion I reported the microscopic appearance in the hanging drop so as to save time. On the following day the reaction in the sedimentation tubes showed to B typhosus complete in 1 in 100 trace in 1—200. To B paratyphosus B complete in 1—40. To B paratyphosus A complete in 1—20. The serum sent on 18th October gave the following—To B typhosus complete reaction in 1—400 dilution, distinct reaction in 1—800 dilution, trace in 1—1,000 dilution. The serum was not tested by B paratyphosus A and B, as the first reaction was evidently a group reaction."

Clinical Notes—Case sporadic. No case of enteric has occurred in the man's regiment for over a year. No history of infection through any source. Specific

eruption absent. He had some diarrhoea during the fastigium, but no other abdominal symptoms. Spleen normal. There was some drowsiness and mental confusion during the second week of the disease. The patient was a meat eater. Result—Recovery. Duration of fever 24 days. No attempt was made to isolate the specific bacillus from the blood urine or faeces. The temperature chart is given below with the other charts.

The temperature charts of all the six cases with their bacteriological and clinical summaries are as follows—

Bacteriological Summary—The Widal test was positive in four out of the six cases, negative in two. It was positive to B paratyphosus in three out of the six cases, while in two cases the test was positive to both B typhosus and B paratyphosus. Blood cultures were attempted in only one case, the result was negative. In one case the B typhosus was found in pure cultures in the faeces, none in the urine.

Clinical Summary—All cases were sporadic. In no case was there any reason to suspect sewage contamination of food or drink as being the cause of the disease. All six cases were meat eaters. Except in one or two cases where the invasion was gradual and delirium present, usual classical signs and symptoms of true typhoid were absent in all cases. They all recovered.

Knowing the interest which Lieutenant Colonel D B Spencer, M.S., takes in the subject of enteric fever in India, and availing myself of his presence in the station, I brought these cases to his notice, the last two being personally seen by him, and he has kindly furnished me with the following significant remarks which I publish with his permission—

Colonel Spencer's remarks—"Many thanks for giving me an opportunity to see something of enteric fever in Poona. These cases are, in many respects, similar to a number of cases I have seen in different parts of India in the course of my service, with the exception, perhaps, that, in most of your cases, the Widal test was positive, while in the few cases where the test was applied, it was negative in mine. The personal equation must count for something in bacteriological observations as in many other things, but even admitting that the observations made were absolutely correct, I think it is possible to attach too much importance to the positive Widal in your cases."

It is known that the blood of a healthy person will sometimes react to the B typhosus. Quite recently a case came under my personal observation, in which there was high continued fever, lasting for more than two weeks, with a distinctly positive Widal, strongly suggesting that the case was one of typhoid fever, but which, on closer examination, turned out to be one of suppurating venereal buboes which the patient, a native, had carefully concealed from a false sense of modesty. The buboes were opened, and the temperature dropped to normal. A positive Widal *per se* is no proof of genuine typhoid infection. It is only when the test is read in conjunction with the clinical and epidemiological aspects of the case, that it is of some corroborative value. Thus the agglutinins of the paratyphoid and colon bacilli have been known to react with the B typhosus and *vice versa*, or what is called "overlapping," has been noticed and recorded by many scientific observers, including Dr Sydney Martin, F.R.S. At the last international Congress of Hygiene and Demography, Professor Courmont of Lyons stated his opinion that, for differential diagnosis between true typhoid and fevers of the paratyphoid group, the blood cultivation methods must be employed, the agglutinin reaction being insufficient and unreliable for diagnostic purposes.

"For my part, I think it is reasonable to believe that allied germs can produce allied toxins and that allied toxins must produce allied antitoxins and allied manifestations of disease, but chemical pathology has not yet advanced so far that we can isolate and individually examine the biological poisons and their natural antidotes in the blood so as to differentiate the fevers of the

typho coli group, of which true typhoid is, so to speak, the highest expression.

"The more I see of enteric fever in India, the less I am inclined to call it a specific disease as usually understood when one speaks of specific fevers, and I have drawn some attention to the subject in my previous writings. To satisfy the demands of scientific accuracy in diagnosis, it seems to me that the only course now left is to isolate the bacillus from the blood and identify it by its cultural taste. This will take some time, for its general adoption in a country where it is not always possible to carry out the Vidal test even in every station, and until such consummation is reached, there is bound to be some confusion in the diagnosis of the continued fevers of India.

"I do not think, for instance, that all the enteric cases, as recorded above, are identical with the typhoid fever described in all standard medical works. Whatever the true etiology of these vague, prolonged, irregular continued fevers in India may be (usually sporadic in their incidence), it is, I think, certain that their etiology cannot always be summed up in Eberth's bacillus associated with the sewage contamination of food or drink, as hitherto held in India. I have, time after time, insisted on this point for nearly a decade, and, I am glad to see, that this view is now gradually being confirmed by several independent observers in India.

"These sporadic fevers are, I believe, as often—if not more frequently—caused by allied germs of the typho coli group, but the subject requires a great deal of working out yet before any finality can be reached. I will here only draw your attention to two points, because I think they are very important. One is, that these allied germs are ubiquitous in external nature (water, air, soil), the second is, that they are always present in the human intestines. I am referring to Gaetnor's bacillus and the B coli communis of which there are innumerable varieties. The nearer the causative factor is to the B typhosus in these sporadic fevers, the nearer naturally will be the type of the fever to the book disease. The cases reported by Dr. Aldo Castellani of Ceylon in his valuable paper entitled 'Paratyphoid fever in the Tropics' and published not long ago in the *Lancet*, clearly show that mixed infections are not uncommon in the tropics, which implies in its turn that more than one member of the typho coli group take part simultaneously (symbiosis) in the disease-process.

"For my own part, I do not think it is impossible that occasionally one of these allied germs can undergo evolution in the human intestines and become transformed into a genuine typhoid bacillus, if one does not previously exist in the intestines. For, how are we to account otherwise for the fact admitted by many bacteriologists and amply verified by our Indian experience that, while the B typhosus or paratyphosus is not unfrequently present within the human body, their presence can seldom be demonstrated in external Nature? Pure cultivations of the B typhosus are unknown in external Nature, it cannot propagate itself there in the presence of other germs stronger than itself. Does not this simple fact point to evolution within the human body—a process which, if it is possible in the higher scale of creation, must surely be admitted as possible, where such minute atoms are concerned, as the members of the typho coli group!

"I will venture to add that this question of evolution in the intestines is probably intimately connected with the question of food. It must be remembered that a certain environment is always necessary for any evolutionary process. The food factor in disease is now a well-established truth in medical science, and, judging by my long Indian experience, I will venture to say that the excessive consumption of an animal diet by European troops in India, in a climate where such food is generally unspiced, may possibly explain the relative frequency of enteric fever among European troops, as compared to the same disease

among Native troops, both living and working side by side in our military cantonments, year in year out, under precisely the same hygienic conditions. For the same reason (food factor) the type of the disease among Europeans is, I think, much more acute and more rapidly fatal than among Natives, but the disease essentially is the same, whether among Europeans or Natives, a view in which I am now confirmed by some of my recent observations in India. The difference, where it exists, and it undoubtedly does exist, is, I think, one of degree not of kind. Strange it would be were it otherwise.

'Liko produces liko,
'Potatoes from potatoes spring'

"The theory of infection by dust and flies, so much in favour at present, deserves here a passing notice. I do not deny the suitability of these agents for conveying the germs of infection, but the question, so far as the Indian army is concerned, is not one of their general suitability for infectious diseases which we all know, as the more restricted question as to whether they are the real carriers of typhoid infection in our military cantonments where typhoid fevers prevail. If the question be considered in this restricted way, I should state it as my opinion that while anything like direct evidence in support of the dust and fly theory is wanting, all the indirect evidence is entirely opposed to the theory. We must remember the simple fact, that the same factors would come into operation where not only British but also Native troops live. Native military quarters will not, as a rule, show less dust or flies than the well kept quarters of British troops, and where such common factors exist, they will not, I think, explain either the relative frequency of the disease among European troops or the apparent immunity from the disease of Native troops. What is bad for one community cannot be good for the other, unless we are to assume, *a priori*, that Native troops enjoy a racial immunity against dust and flies very much in the same way as a horse against plague. But what scientific evidence is there for any such assumption? If the difference in figures of the incidence of typhoid in the British and Native communities were slight, one might possibly admit a relative immunity amongst Native troops, the result of their having lived for generations amidst insanitary surroundings in their village homes previous to enlistment in the army. But when we come to study the figures, what do we find? The statistics of enteric fever for the fifteen years ending 31st December 1906 show that there were 21,929 cases of enteric fever among British troops (not counting officers) with 5,481 deaths, as compared to 808 cases with 223 deaths among Native troops within the same period. The numerical strength of Native troops is almost exactly double that of British troops, so that, number for number, the figures would read 43,858 cases of enteric among Native troops, both communities living side by side in cantonments as previously explained, if they were both equally liable to the disease, whereas there were only 808 cases.

"Can the dust and fly theory explain these striking differences in figures? I think not. Why should British troops be thus singled out for their victims? Thus, the theory falls to the ground directly it is subjected to a critical analysis.

"Leaving the incidence of enteric in the army on one side, if we turn our attention for a moment to the large Native civil population of India, what a different picture it presents! In crowded Native towns and cities, and more particularly in the Native village communities where filthy conditions prevail, often in a truly terrible form, genuine typhoid fever both in a sporadic and epidemic form ("explosive outbreaks") is probably widely prevalent. Nearly five million people among the Native civil population of India die every year from "Fever," and it is only human to suppose that a certain proportion of these cases must

be cases of typhoid fever, although, unfortunately, no separate figures are available in our statistical returns in India. But, there, the hygienic conditions are very different from those that obtain in our cantonments of troops, and anyone who wishes to approach the enteric question of India in a calm, judicial mood should, I think, take into consideration the different hygienic conditions in which the different communities—soldier and civilian—live before framing his conclusions.

There is as much difference in the west end of London of the two, as there is say, between that of the well kept fashionable quarters in the east end and some of the worst slums in the enteric question of India. From what I have said, it will appear to you, as I hope, to everybody else, that the complexity must be evident to any one who has really studied it and who does not always speak with a superficial knowledge gained from books or hearsay. Much has been done in the past to unravel the mystery of sporadic typhoid in India, but more, I think, remains to be done. The subject, as I have said, requires a great deal of working out yet, both on the clinical and bacteriological sides simultaneously, and when this is done, I have no doubt that the incidence of the disease in our army, especially among Europeans, will be considerably lessened if it cannot be banished altogether from our statistical returns in India. Yours truly, Sd D B Spencer.

Some practical lessons may be drawn from these cases. The first is that true enteric does occur among natives, but unless they are "luxus consumers and proteids," it does not present the same grave and protean aspects as generally seen in Europeans and detailed in our standard text books. One can confidently affirm that not one of the above cases could have been diagnosed as enteric from the clinical features alone, and in the absence of a positive 'S C F.' In fact, with the exception of continued fever, some loss of weight and slight debility, they had nothing in common with enteric as seen in Europe. A second conclusion is that if a fever lasts over one week, does not yield to quinine hypodermically, and repeated examination of the blood is negative for malarial parasites, typhoid should be necessary and at least three Widal tests at intervals of blood cultures and the diagnosis can be confirmed by isolation of the Specific Bacillus from the faeces, wine, or blood. In one case lately seen here the Widal test was negative on the 7th day of the month, but gave a positive dilution on the 9th, or only two days later. A single negative for Widal does not exclude enteric. On the other hand, Koch's canons should be rigidly applied, and in the absence of a delicate positive Widal, confirmed by recovery of the B typhosus, the disease should not be called Enteric. It is worth considering whether the term "Typhoid" should not be exclusively reserved and revised for sporadic types of continued fever, from which B typhosus cannot be obtained, which are non fatal in character, do not lead to explosive outbreaks, and have none of the text book signs of enteric.

The importance of meat eating as a predisposing factor cannot be exaggerated, and yet my idea is that a much wider general induction that embraces meat eating best satisfies the facts in the incidence and immunity of the disease. "The luxus consumption of proteids" as a predisposing cause explains the greater incidence of the disease on Europeans (and their children overfed with milk e.g.) and on Gurkhas, Punjabi Mussulmans, Pathans, Dogras, and the Natives and their associated jail population, and the comparative immunity of cereal eating castes who are strictly so, and of our soldier prisoners and of the seasonal variations and arms of the service, etc, etc, as detailed in Roberts' Enteric Fever in India.

The pythogenetic theory of Merchison is again coming to the front, and it appears to me that the condition of one's intestinal canal has a great deal to do with the liability one incurs. No doubt the germ is the true cause whether carried by flies or infected food, or fingers, etc., but it cannot gain a foothold in those who are not already predisposed to nurture it by "the prepared ground" of an irritated intestinal canal superinduced by "luxus consumption of proteids." Let it not for a moment be supposed that this charge of glutony against every sufferer from enteric term excess of proteids is merely relative, and it is the condition set up by a small quantity for one or a large amount for another that determines one's fate. I was very glad to read of Col Spencer's presence in Poona to show him these and other enteric cases. His remarks are worthy of attention of those interested in Enteric in India.

A Mirror of Hospital Practice.

TALMA'S OPERATION FOR ASCITES

By R F HEBBERT,
LIEUT. I M S.,

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THE following two cases, operated on at the Cantonment Hospital, I think, are of interest, as it seems to me that this operation has not had as extensive a trial as it deserves. The medical treatment of ascites, due to hepatic cirrhosis, is very unsatisfactory.

Case I—A boy of 12, Halwai (sweet maker) by caste, he was an orphan, and so his past history is uncertain. From enquiries made by the Hospital Assistant, I have reason to believe the boy was in the habit of taking alcohol. He had no signs of congenital syphilis. The spleen could not be felt on palpation. There were no signs of tubercle anywhere.

A year before admission his belly began to enlarge. He was tapped four times at the Prince of Wales' Hospital, Benares, and twice in the Sick Roll Civil Dispensary.

He was admitted into the Cantonment Hospital on July 30th, 1907. He was put on a milk diet and given a quinine, iron and arsenic tonic and Epsom salts. The belly continued to fill. He was tapped on August 8th, ten pints of fluid being evacuated. Again tapped August 20th, ten and a half pints being evacuated. I saw patient first on August 31st. His belly was very large and distended and his feet cedematous. A few veins were visible on the abdomen. His tall body and limbs were greatly emaciated, unfortunately I did not take a photo of him or have him weighed. I increased the mag sulph to 1 dram 5 times a day. On September 1st he was again tapped, eleven pints being evacuated. I operated on September 12th by which time the belly was again greatly distended.

Having first removed about five pints of fluid by tapping, a vertical incision extending down from the costal margin for about four inches just to the right of the mid line was made. The abdominal wall was very thin, practically no rectus being visible. The peritoneum was opened and the rest of the fluid evacuated. I could feel no enlarged mesenteric glands or any signs of tubercle. The liver was hard and the surface nodulated, showing typical cirrhosis of a not very advanced stage.

The peritoneum was then separated from the parietes for about two inches on either side of wound, and the

great omentum, being pulled up, was inserted into the space thus formed

The surface of liver was then rubbed and two large gauge plugs, about 18 inches long, inserted between the liver and diaphragm, one on either side of the falciform ligament

The lower part of wound was then sown up with silk sutures and dressings applied

Patient stood the operation well. The next day the plugs were removed and the wound closed with another suture. The wound healed by first intention.

Patient was kept on mag sulph 1 dr threetimes a day.

Fluid began to reaccumulate and I thought the operation was going to be a failure.

By the end of September it began slowly to disappear. About the middle of November it had nearly entirely disappeared. I took him off the mag sulph and put him on full diet.

At the end of November (29th) I discharged him, as a man in the bazar offered to adopt him. The ascites had quite disappeared and there were many enlarged veins visible at costal margin over the hepatic region as also round seat of operation.

Patient has repeatedly come to see me since. The last time was about the middle of April 1908. There was no signs of fluid in the abdomen and patient had become a fat chubby boy. The difference was remarkable, from the emaciated appearance he had before.

There were two other cases of ascites attending hospital at this time. One was a boy of about the same age as above, and very similar history, the other a man of 35. The parents of the child would not make up their minds to let me operate. Before the above case was definitely cured, this boy died. After this the man consented to have the operation.

Case II—A man of 35. He was a very bad character. Ever since the death of his son from plague three years ago, he had been drinking excessively. His belly first began to fill on January 1906. In May he was first tapped, 28 pints being evacuated.

On August 13th, 1906, he was admitted to the Cantonment Hospital, Benares. He was tapped every 20th day and discharged on December 26th. He attended regularly after this for tapping. I admitted him on November 6th, 1907. He was very emaciated. His pulse was poor. Numerous large, dilated veins were visible on the abdomen.

I operated on November 7th. He stood the operation badly, there being considerable shock. The liver was intensely hard and the surface very nodular. Patient gave a lot of trouble, continually removing his dressings. The wound, however, healed by first intention. Patient would not take his medicine and managed to get alcohol brought to him. I discharged him in 10 days, still giving him milk, but made him take a dose of mag sulph before each glass of milk I gave him.

The belly filled again and I tapped on November 21st. After this the fluid remained stationary and seemed to me to be slowly decreasing. I saw him no more after December 29th when I went out to manoeuvres. The fluid was distinctly less, there only being a moderate amount of distention. Patient, however, was extremely weak and still very emaciated.

I heard afterwards that the fluid reaccumulated rapidly in the beginning of February, patient being tapped on February 4th. Patient died 12 days later (I believe in coma).

This case, I think now, was unsuitable for operation as the history was a long one. The distended veins on the abdomen showed that the body already had made a great effort. Patient evidently died from want of enough healthy liver.

I think, though, as far as the ascites goes, the case is encouraging, as from November 21st to February 4th no tapping was necessary and the fluid largely diminished. Patient continued drinking to the end.

NOTES ON JUDICIAL HANGING

BY F J DALEY,

LIFUT, ISMD,

In Medical Charge, Alipore Central Jail

IN forwarding the attached statement of Judicial Hangings in the Alipore Central Jail of 8 consecutive cases, it will be seen in the remark column the result of the length of drop compared with height and weight that no hard and fast scale can be laid down to govern all cases. Each individual must be considered separately and a drop allowed accordingly.

In the case of No 2 on the list, he was of a muscular and compact build. The result of the drop was an excessive rupture of the muscles of the neck compared with No 5, aged about 40 years, a decrepit and sparsely built man, with no muscular resistance, who had to be carried and supported on the scaffold, he was practically of the same weight and height as No 2, in this instance only did dislocation of the axis bone occur. Most of the culprits hold themselves rigid, the result then depends on their muscular resistance.

Serial No	Date of Execution	Registered No	NAME	Age & Sex	Crime	Height	Weight	Length of drop	REMARKS
1	35 02	9130A	S A	28 M	Sec 302	5' 9"	134 lbs	6' 0"	1 Fracture of thyroid cartilage 2 Dislocation of pottum adami 3 Transverse fracture of body of 2nd vertebrae 4 Left greater corner of hyoid bone fractured
2	30 11 03	2963A	A S	23 M	Do	5' 3"	107	6' 0"	1 Neck muscles ruptured 2 Spinal column including cord divided 3 Fracture of body of 2nd cervical vertebrae (axis) and separation of articular processes of 2nd and 3rd cervical vertebrae

Serial No	Date of Inoculation	Registered No	NAMES	Age & Sex	Crime	Height	Weight lbs	Length of drop	REMARKS
3	15 1 04	9381A	A C S	20 M	Secs 302 & 392	5' 1"	103	5 6'	Complete dislocation of 2nd and 3rd vertebrae, separated for about $\frac{1}{2}$ " but no fracture. The spinal cord corresponding was found stretched, but not ruptured.
4	25 6 04	4359A	P D	18 M	Sec 302	5' 3'	115	5 6"	Complete fracture of thyroid cartilage and the greater corner of the hyoid bone (on its right side). There was no fracture nor dislocation found of the vertebrae.
5	At 6 30 A M 22 12 05	7583A	P N M	40 M	Do	5' 3"	108	5' 0'	Dislocation of the 2nd cervical vertebra with rupture of the thyroid hyoid membranes and annular ligament with compression of the spinal cord corresponding.
6	At 6 30 A M 29 12 05	7490A	K U	30 M	Do	5' 5'	119	5' 0"	No dislocation, no fracture of the atlas or axis or superficial muscles on either side, ligaments intact, membranes cricothyroid and thyrohyoid and larynx exposed.
7	At 6 30 A M 30 12 05	7279A	M N	30 M	Do	5' 5"	105	5' 0"	Post ligaments ruptured corresponding with 1st and 2nd cervical vertebrae. There was separation of the 2nd vertebra to the distance of about $\frac{1}{2}$ ", the odontoid process, as also the annular ligament, was in position. There was also simple fracture through the articular facet (left) of the axis. There was a considerable amount of extravasated blood in the tissue on the left side with rupture of the thyrohyoid membranes.
8	At 6 30 A M 30 12 05	7278A	T N	28 M	Do	5' 3"	122	5' 0'	Complete separation of the 2nd and 3rd cervical vertebrae, about $\frac{1}{2}$ ", with corresponding cord stretched. The left lateral ligaments between the 1st and 2nd vertebrae was found ruptured, as also the thyrohyoid membranes. There was the usual extravasated blood in the tissue.

Mitral Stenosis—According to some writers, mitral stenosis discovered in patients in whom there is no history of rheumatism is probably of congenital origin.

Drug-Taking—Half the world believes that the taking of drugs is all that is required for the medical art, and that for every ache and pain or other bodily trouble to which humanity is subject, a remedy may be found. Thus mere drug-giving for every ache or pain is a popular want and if it is found that some medical men pronounce that this is the first and only thing to do, it is not remarkable that so many patients flock to them.—*Sir Samuel Wills*

Calomel in High Blood-Pressure—Small doses of calomel— $\frac{1}{2}$ to 1 grain—given every night for a short time and repeated at intervals is of great use in reducing undue blood pressure.—*Dr Herringham*

Duodenal Ulcer—When once a duodenal ulcer has given rise to hæmorrhage, whether this be shown by hæmatemesis or mælena, the bleeding, it may be taken for granted, will be repeated, and the recurrence of the bleeding may be severe or even fatal. My conviction is that a second hæmorrhage ought not to be

waited for, but that operation ought to be undertaken as soon as the first bleeding has ceased.—*Mr Mayo Robson (The Hospital)*

Arrangements are being made for a fresh Commission to proceed to East Africa to study sleeping sickness. Its object is to continue the work carried on from 1902 until it was temporarily suspended in 1905 owing to the death of Lieutenant Tulloch, who contracted sleeping sickness during his researches in Uganda. The Commission, which is to be sent out under the auspices of the Royal Society, will be in charge of Col Sir David Bruce, C.B., F.R.S., R.A.M.C. He will be accompanied by Captain Hamilton and Captain Brakeman, R.A.M.C. The mission will leave England on September 25th, and travel by way of Mombasa to Lake Victoria on the northern shores of which the Uganda Protectorate is preparing a laboratory in the Province of Chagwe, two miles from the lake, for the use of the Commission. The work of research will include the study of the natural history of the fly and also of Dr Koch's theory that crocodiles provide foodstuffs for the *Glossina palpalis*. The Commission will also investigate the question whether the lower animals harbour the parasites and the exact method by which the fly transfers the parasite.—(*B M J*)

Indian Medical Gazette.

AUGUST, 1908

THE NEED OF A MEDICAL REGISTRATION ACT FOR INDIA

THE resolution passed at the last meeting of the Medical Section of the Asiatic Society, to which reference will be found in another column (p 315), is one of vital importance to all those—European or Indian, Official or Non-official—who practise the European system of medicine in this country.

This is by no means the first occasion upon which the question of a Medical Registration Act for India has been raised. As far back as 1890 an unsuccessful attempt was made to pass a Bill for the Registration of Medical Practitioners in the Bombay Presidency, and in Volume XXV of the *Indian Medical Gazette* will be found, at p 148, extracts from a letter written by Dr W K Hatch, which concludes with the following suggestive sentence—"It is a pity that the Indian public are so supine in regard to this most important matter which gravely affects both public and private interests."

The matter was again brought strongly to the notice of the Profession by the late Surgeon-General Harvey in his Presidential Address to the First Indian Medical Congress, held at Calcutta in December 1894. In the course of his speech, he said—

"Another need greatly felt by the Profession is that of some such Act as the Medical Act of England, by which properly educated and duly qualified men may be distinguished from a host of quacks, charlatans and imposters who everywhere abound. It is not to be expected that the State can put down, or try to put down, quackery, but it would be something to be able to tell regular practitioners from the predatory free lances, and, if in addition to a register, some body analogous to the Medical Council of England were appointed, another advantage would be gained, and it would be possible to elevate and improve the condition of the Profession by purging it of those members—few and yet still more common than they ought to be—who disgrace themselves and help to degrade Medicine by public advertisements, the issue of obscene catalogues and other objectionable practices" (*Transactions of the First Indian Medical Congress*, p 7)

Since then, from time to time, representations upon the subject have been made to Government, but no serious or united action

was taken by the Profession until a few months ago, when it became evident that the continued multiplication of self-constituted bodies, granting diplomas and licenses to practise medicine, which are colorable imitations of those bestowed by English Colleges and Indian Universities, had become a serious danger not only to the Profession but also to the public who have no means of gauging the value of the imposing parchments in the possession of the pupils of these so-called "Medical Schools." There are at present no less than five institutions of this description in Calcutta itself, and a sixth has recently been started in Dacca. With one exception, none of them make any serious attempt at teaching, none of them have adequate hospital or laboratory accommodation, there is no fixed standard of preliminary education, each school grants its own diplomas, and there is no system of outside inspection. It is hardly necessary to say, therefore, that the men turned out by them have neither the practical nor the clinical experience which the public has a right to demand from those who profess to be fully qualified practitioners according to European standards.

Although this is a matter which affects the Profession as a whole, it is one which chiefly concerns the Indian Practitioners, who are the principal sufferers from the competition of these imperfectly trained men, and this aspect of the question was forcibly brought to the notice of his Indian confrères, on March 31d, by Dr K C. Bose, CIE, Rai Bahadur, in his presidential address to the members of the Calcutta Medical Club, in the course of which he said—

"Some of our leading practitioners, in their noble attempts at organising medical institutions by indigenous efforts, have unconsciously encroached upon the legitimate field of duly qualified men and have also lowered the prestige of the Profession by granting certificates and diplomas to men who by the standard of their preliminary education are unfit to hold them. I do not mean to be understood that I do not encourage indigenous enterprise, but what I mean to impress upon you is that either make no attempt or make a bold and vigorous attempt. Raise your school to the level of other recognised schools, and then request Government to grant diplomas to your students after they have passed their tests along with the students of the Government schools. The power of granting diplomas should rest with the Government only, and with nobody else. This would certainly raise the status of the existing Medical Schools and will give a better value to the National enterprise. Apart from the disadvantages already mentioned, there are others of a more serious nature which, if not removed by legislation, will continue

to exercise their pernicious influence upon the legitimate prospects of duly qualified men. It is high time to think of suppressing the quackery and charlatanism which prevail in Calcutta. The law is deficient in this respect. Anyone can style himself a doctor provided he cares to pay annually twenty five rupees or less to the Municipality to secure a pass port. Men who do not know the alphabet of Medicine are allowed to treat patients with Arsenic, Aconite, Corrosive Sublimate and other active poisons. Government has taken precautions to prevent touts from infesting Law Courts, but has not done anything to prevent quackery in Calcutta, which is the metropolis of the British Empire. We anxiously look to Government to protect the interests of qualified medical practitioners."—*Calcutta Medical Journal*, Vol II, No XII, June, 1908

This very outspoken address has already borne fruit, for at a largely attended public meeting of the Medical Practitioners of Calcutta and its neighbourhood, which was held on Monday, July 6th, in the Hall of the Calcutta University Institution, the following resolution was adopted by a majority of those present—"That the time has come for considering the question of preventing the granting of degrees which are properties of Indian Universities by a Medical Registration Act or otherwise, and also for taking steps to safeguard the interests of persons practising the system recognised by the Indian Universities."

A Committee, with power to add to their number, was also appointed to consider the questions in all their details and report as soon as possible to another meeting of the Profession.

But this is not the only direction in which action has been taken. The attention of the Syndicate of the Calcutta University was recently drawn by one of its Indian graduates to the granting of medical diplomas and licenses by certain private medical institutions of recent growth and questionable competence. The Syndicate referred the matter to the Faculty of Medicine for an expression of opinion. This body, after full discussion of the question in all its bearings, adopted the following resolutions which were accepted by the Syndicate, and have, it is understood, already been forwarded for the consideration of the Government of India—

(1) "That the Faculty of Medicine is of opinion that the University ought to safeguard the interests of its graduates, especially as there is no Medical Registration Act in this country.

(2) "That the Syndicate be asked to obtain legal opinion as to how the granting of degrees, licenses, etc., by unauthorised persons and bodies may be prevented and how such persons and bodies may be proceeded against.

(3) "That the Syndicate do move the Government of India on the necessity for a Medical Registration Act for India, so as to prevent unauthorised persons or self constituted bodies from granting Degrees or Licenses to practise medicine under the European system as recognised by the Indian Universities."

Commenting upon the above resolutions, the *Calcutta Medical Journal*, which is the organ of the Calcutta Medical Club, has the following editorial—"The question of having a Medical Registration Act for India has for many years engaged the attention of the Profession and spasmodic efforts at inadequate representation to Government have from time to time been made without success. One can at once see the difficulty of the Government to pass a general Act of Registration for India, for that would interfere with the practice of the different systems of Medicine which are almost as many as there are medical practitioners in India, and it would naturally cause much discontent. Moreover, any restraint put on the practice of *Kabiraj*s and *Hakims*, however unscientific it may be in its present form, would be a source of extreme hardship to a large section of His Majesty's subjects who would not take any medicine but the indigenous from considerations of religion and caste. The difficulty it seems has been got over by the qualified resolution (No 3) of the Faculty quoted above. The public should have no cause for complaint, as any Act passed in the spirit of this resolution would not touch any other system of Medicine but the one taught by the Universities of India. On the other hand, the general public have much cause for congratulation, as such an Act would gradually purge out the unqualified self-styled medical practitioners, *with or without bogus degrees*, who at present are a great danger and nuisance to the community."—*Calcutta Medical Journal*, Vol III, No I, July, 1908.

We heartily endorse every word of the above, and now that it is clearly pointed out that no harm is intended to either Baidis or Hakims, and seeing that there is nothing either spasmodic or inadequate about the present representations which obviously meet with the support of the whole body of the Profession, we trust that the Government of India will be able to undertake some form of legislation with a view to the fixing of a definite standard of preliminary and medical education and the registration of all those who profess to practise Medicine on the European system.

Such an Act as is now proposed need not in any way cripple the legitimate expansion of Indian institutions. On the contrary, it would prove a lasting benefit both to the Profession and the public, if it were to cause the amalgamation of all these small Medical Schools into one large and properly equipped, National, Medical College for which there is ample room in Calcutta, and for which an admirable nucleus already exists in the Albert Victor Hospital at Belvedere.

Current Topics.

A MEDICAL OFFICER'S CAREER

THE death at West Southbourne on 5th May 1908, of Surgeon-Major Theodore Duka, IMS (ret'd), closes a career unique in many respects.

Theodore Duka came of an old and notable Hungarian family. He was born at Dukafala, an ancient Manor in Hungary, on 22nd June 1825, and was educated at the Lutheran College at Eperjes. He first studied law in the University at Pesth, and in 1848 he obtained a Government appointment in the Financial Department under the celebrated patriot, Louis Kossuth. When the troubles arose with Russia in 1848-9, young Duka joined the National forces and received a commission on the staff of General A. Gorgey, to whom he was appointed A. D. C. He went through the remarkable campaign against the Austrians, which at one time promised to be so successful till the National forces of Hungary were overcome by the intervention of Russia in favour of Austria. Duka went through all the operations of the campaign under General Gorgey, and at the battle of Komorn he behaved with such bravery that he was decorated with the Order of Valour on the field and promoted to the rank of Captain. On the fatal day of 13th August 1849 when the Hungarian forces had to surrender, Duka was taken prisoner along with General Gorgey and his staff. After long and exciting adventures Duka and many others of his countrymen succeeded in escaping and found his way to Paris and thence to London in 1850, where he soon became a naturalised British subject (in 1853). He was naturally a good linguist and at first earned his living by teaching German at the Bunsen Institution. He then turned his attention to Medicine and studied at St. George's Hospital. In due course he became M. R. C. S. England, and M. D. (St. Andrews) in 1853, becoming F. R. C. S. (Eng.) in 1866. He received a commission in the Bengal Medical Service as an Assistant-Surgeon in 1854, he was promoted Surgeon on 1st August 1865 and Surgeon-Major on 1st July 1873 and

finally retired on 27th March 1877. He had no war service in India, but was Civil Surgeon of Monghyr during the troubled times of the Mutiny and remained there for ten years from 1854 to 1864.

During his residence in India he acquired a good knowledge of Oriental Languages. He was the author of the "Life and Works of Csoma de Koros (1819-42), the young Hungarian Scholar who travelled in Central Asia and Tibet, and who is buried in the Cemetery at Darjeeling, where his tombstone, erected by the Asiatic Society of Bengal, is still to be seen, close by that of General Lloyd, the discoverer of Darjeeling. In 1899 Duka published a smaller work entitled, "Kossuth and Gorgey, or Recollections of a Stormy Period," and in 1888 he had published a professional work as "Child-bed fever, its causes and prevention." He married in 1855 and Mrs. Duka still survives. On his retirement from India he resided chiefly in India, paying many visits in later and happier times to his native Hungary. He was made a Knight of the Lion Crown of Hungary and was a Fellow of the Royal Asiatic Society and of the Hungarian Academy of Sciences. He died at the advanced age of 82 years.

THE ROLE OF EDUCATED INDIANS AS DISSEMINATORS OF SANITARY TRUTHS

DRS M. L. DHINGRA and B. L. DHINGRA have sent us the first of a series of pamphlets dealing with the preservation of health and the prevention of disease in India, they are by permission associated with the name of H. E. the Viceroy (and are called Minto Health pamphlets), whose earnest efforts for the eradication of plague and feeling exhortation to educated Indians to co-operate in the matter stimulated the authors to undertake the publication of the series of pamphlets.

We all have found that the very first step in the stamping out of an epidemic is to convince the people of the necessity of preventive measures. This is a truism often made use of, but the fact remains that the educated classes in India especially are too often extremely ignorant of the elements even of disease prevention. As the Drs. Dhingra say—"The greatest ignorance and indifference prevail. The masses have a childish belief in charms and spells, they are greatly attracted by well advertised patent medicines and by itinerant quacks. Experience shows that the attitude of our people is generally hostile to modern public health measures, and it is obviously impossible for the Government to make us healthy without our active co-operation. If we (medical men) work with tact, sympathy and perseverance, we may, in a few years, arrive at a stage when the more intelligent among our people will look with horror on overcrowding and dirt, etc."

The Dr. Dhingras then enunciate the following "laws of health" —

(1) To breathe pure air, (2) drink pure water, (3) eat wholesome, suitable and sufficient food, (4) to dwell in dry, bright, airy houses, with good drains and healthy surroundings, (5) to observe cleanliness in everything, (6) to acquire good habits, *re*, abstain from alcohol, opium, cocaine, etc., and observe moderation and regularity in food, exercise, sleep, etc., (7) to take sufficient exercise every day, (8) to avoid overwork, (9) to wear suitable clothes and (10) to avoid early marriage and to control our passions, and (11) to take proper precaution against communicable diseases. Each of these headings is fully treated.

We commend these pamphlets (which are published by the Pioneer Press at eight annas) to our readers. We hope they will have a wide circulation.

MALARIA PROPHYLAXIS IN THE DUARS

A VERY useful note has been compiled by six medical men in charge of tea estates in the Duars on the subject, "Practical methods of antimalarial sanitation." The pamphlet has been written for the benefit of the tea-planters in these unhealthy regions at the foot of the Himalayas. It is clearly and well written and is eminently practical.

The great loss of labour and money caused by sickness among coolies, clerks and Managers is first shown clearly.

The often severe sickness and mortality among the hill coolies imported from Darjeeling, Sikkim and Nepal is pointed out. It is also shown that there is now no mystery about malaria, it is a disease conveyed from the sick to the healthy in a perfectly definite way by the mosquito. The most dangerous kind in the Duars is *A. listoni*, a dark brown or black mosquito with no definite white spots or bands.

The method of checking malaria are therefore—

- 1 Destruction of the parasite (in the blood)
- 2 Destruction of mosquitoes which carry the parasite
- 3 Protection of human beings against mosquito bites
- 4 Separation of infected persons from the uninfected

We need not quote the remarks on the use of quinine, but it is wisely pointed out that black-water fever so common and so justly dreaded in the Duars is the result not of taking too much quinine, but of not taking enough and of allowing repeated attacks of 'mild' fevers to occur which should have been effectually stopped by proper doses of quinine. "*These mild fevers more or less continuous, with inadequate quinine treatment, are especially dangerous*" as Stephens wrote. The six medical men then recommend a daily five-grain dose of quinine. The European manager can be persuaded thus to protect

himself, it is more difficult to get the Bengal clerks to be intelligent enough to thus help themselves. The method of treating coolies in the Duars that is recommended is to give 10 to 20 grains per week, and probably it is better to give a five-grain dose on the 6 working days of the week.

Messrs Buirroughs and Wellcome's *Tabloids*, if indented for in large quantities, can be obtained at a rate of about one rupee per hundred, but we hope that, in the near future, it will be possible for the Government Quinine factory at Serail, in the hills above the Duars, to turn out millions of quinine tablets at a cost which will make it possible to distribute quinine in this form all over India.

The need for good and well qualified medical subordinates is pointed out, and it is said that good men are being got at Rs 60 per month and a servant. A competent medical subordinate is well worth the cost.

Practical instructions are next given as to the destruction of mosquitoes, and the regular application by means of the "eclair" or the "auto-spray" of a low grade kerosine oil is strongly recommended. Sensible advice is given on the use of mosquito-curtains.

Not much is said about wire gauze screens for rooms. No doubt these screens can be made useful and we know of several houses where they are used, they do help to keep out mosquitoes and other troublesome insects, but there is the feeling that the fresh air is also kept out, and in any case they can only be used in the warm weather along with punkhas.

"Our practical recommendations are, in short, without insisting on details—

(a) *Regular* doses of quinine in five-grain doses, daily or in larger doses at longer intervals. This is of the very greatest importance for all, Europeans, Bengalis, coolies, especially Nepaulese, men, women, and, above all, children.

(b) Destroying mosquitoes in their breeding-places by clearing jungle, draining, filling up pools, and spraying kerosine oil in selected situations.

(c) Screening bungalows and babu's houses with wire gauze. The strict use of the mosquito-net *all the year round*. Anopheles are quite as easy to find in the cold weather as in the rains.

(d) Segregation of Europeans, Bengalis, and as far as possible of the different races of coolies from each other."

This pamphlet is a very practical one and should be of great use to planters in the Duars and to all others who have to live in malarial localities.

We hope that an earnest attempt will be made to carry out their recommendations.

HÆMAGLOBINURIC FEVER

WE have received a reprint from the *Memphis Medical Monthly* of a very complete monograph

on the history, literature and symptomatology of hæmoglobinuric fever, written by Dr W H Deaderick, of Arkansas

The description of the geographical distribution of this symptom or disease is very complete, but when he says that it is common in a "region between Meerut and the Indus River," we fear he must have been looking at a very small map, for this distance comprises the whole breadth of the Punjab

A great array of statistics is given in attempting to show frequency of the disease, but it is recognised that while the number of cases in any locality is small, nevertheless the morbidity is high. We are very doubtful as to any increased prevalence of the disease, but we admit that it is increasingly recognised. Epidemics of the disease are not unknown, as for example one recorded by Masterman (*B M J*, Feb 10th, 1906) in Jaffa and by Plehn (*Deut Med Woch*, 1895). Sanibon too (*Practitioner*, March 1901) refers to an epidemic among labourers employed in making a canal at Corinth, to another among Chinese coolies working on the Congo Railway and in 1885 there was an outbreak of 24 cases in the prison at Castiadez in Sardinia.

In the Chapter on Etiology Dr Deaderick has collected a great amount of information, derived from the literature of the subject (his bibliographical references at the end of the monograph amount to 141).

He says it is chiefly by a disease of the white races, but as we know in the Duars, educated Bengalis not infrequently suffer, and Plehn in his work on the Cameroon Coast refers to an extensive outbreak among Cameroon negroes. In the German East Africa Report for 1903-4, eight cases among negroes were referred to Daniels (*Laboratory Studies*) tells us of cases among coolies imported to the west Indies from India. Creoles suffer, and one of the names given to the disease has been the "yellow fever of Creoles." Masterman reported cases among Jews in Palestine, and Rothschild saw cases on mixed breeds and in pure Indians in Nicaragua.

Males suffer more than females. As regards age, cases are most frequent in adult life. In the tropics it is perennial, says an author; in temperate climes it follows the malarial season. Tomaselli and Daniels have referred to a family predisposition to the disease. It is easy to assume an idiosyncrasy in particular cases. Previous attacks are common, "in the tropics (says our author) about one-fourth of the subjects have had more than one attack. F. Plehn says he had five attacks and Dr Cross "at least ten severe attacks." There is, therefore, but little active immunity.

Length of residence in the home of the disease is a factor of importance. The following table is worth quoting.—

	1st yr	2nd yr	3rd yr	4th yr	5th yr	Over 5 yrs
Barot and Legrand, 100 cases	6	22	13	20		0
Daniels, 114 cases	21	40	27	12	5	9
Berenger Lérand, 185 cases	10	12	79	37	9	2
Vody, 51 cases	5	7	28	5		4
Total	42	111	177	74	16	20

The attack curve would show a rise till the third year and then a fall. There seems according to Daniels to be a somewhat greater prevalence of the disease in higher altitudes, but we do not think this applies to India.

Cases but not very severe ones often occur after the patient has left the endemic region.

As with malaria, cases not uncommonly occur among labourers, employed on work "which necessitates turning over the soil." Exposure to cold and damp may be admitted as occasional causes. Dr Deaderick says "the influence of alcohol has probably been overestimated."

It may be held (says our author) with absolute certainty that previous infection with malaria is essential.

As is well known, there are three chief theories about the disease, viz, (1) that it is malaria, (2) that it is quinine sulphate poisoning, (3) that it is a disease sui generis.

The following table showing the number of times malarial parasites have been found present may be worth quoting, always bearing in mind the warning of Stephens and Christophers that the parasites are found in a far higher percentage of cases if examined the day before the onset of the symptom hæmoglobinuria.—

Observer	No of cases	No in which parasites were found	Observer	No of cases	No in which parasites were found
Kanellis	20	10	Daniels	16	4
Bignami	2	1	Broni	14	2
Vincent	5	1	Krauss	11	7
Dryepondt	1	0	McElroy	23	9
Iowell	11	5	Kleine	15	6
Koch	16	2	F. Plehn	33	22
Hanley	13	0	Ruge	1	1
Cardamatis	25	4	Troussaint	7	5
Burns	3	3	Ollwig	15	6
Boisson	3	3	Hoffman	3	2

The disappearance of the parasites is naturally explained by the excretion of quinine, and the rapid hæmolysis in which the weaker cells containing the parasite naturally succumb first.

It is said that the æstivo-autumnal parasite is found in a majority of cases, but cases with tertian parasites have been recorded. "Toxins, the product of the malarial parasites, while often assumed, have not been demonstrated."

The testimony of the parasites is supported by the two subsidiary evidences of malaria,

pigmented leucocytes and mononuclear leucocytosis

As regards the great argument against the malarial nature of blackwater fever, namely, that the geographical distribution of malaria is infinitely wider than that of blackwater, our author says "it is not met with except in markedly miasmatic regions"

The writer's opinion then is, that malaria is "essentially and solely the predisposing cause, and in some cases it may also act as the exciting cause" The relation of blackwater to quinine has been known since the publication of Tomaselli's observations in 1874, but the question became acutely discussed only since Koch's too dogmatic pronouncements Our author quotes 41 authorities in favour of the statement that quinine has the power to provoke hæmoglobinuria in individuals, but the matter had not really advanced till the recent publications in this journal of the observations of Captain D. McCay, I.M.S., on the share of the sulphates in the production That attacks can be produced repeatedly at will by a dose of quinine has been recorded by many writers (our author quotes no less than 15 such) There is no relation between the amount of quinine and the intensity of the attack several cases have followed half a grain The interval between the taking of quinine and the onset of the symptom is put at 6 hours

Our author sums up his view of the share of quinine by saying that "the predisposing cause is always malaria, the exciting causes are a fresh malarial invasion, quinine or other drugs, exposure, exertion, mental states, etc

Dr. Deaderick then elaborates his own theory, which is divided into the following stages (1) erythromelalgia, (2) hepatic stimulation and production of amboceptors, (3) action of complement, (4) hæmolysis and hæmoglobinuria or the formation of an antihæmolyisin

We have not space to follow our author in his account of the treatment of this affection He quotes several authorities as to the method of using quinine Quennec used chloroform with success, Hearsey used a modification of Sternberg's yellow fever formula, *viz*, bicarbonate of soda, grains 10, liq. hydrag. perchloride, m 30, every 2 or 3 hours Vincent reported very favourably on the use of calcium chloride in doses of 4 to 6 grammes (dr 1 to dr 1½) during the attack, and as a prophylactic

Poli so long ago as 1867 recommended hypsulphite of soda More recently cassia beareana has been lauded and found useful in mild cases Alcohol is to be avoided and also turpentine, diuretics usually do harm The best diuretic is plain water

MALARIAL CIRRHOSIS OF THE LIVER

ADVANCED cirrhosis of the liver with ascites is one of the most common diseases, for which

patients seek treatment in the hospitals and dispensaries of India The condition has not, however, been fully described in any of the textbooks, therefore we welcome the description given (*Lancet*, May 23rd, 1908) by Captain Gordon Tucker, the acting Professor of Pathology at the Grant Medical College, Bombay

The organs affected are the spleen, stomach, liver and kidneys There is a history of long ill-health and progressive enlargement of the spleen, repeated attacks of fever, with intermissions of fair health In two or three years the spleen becomes markedly enlarged, then come secondary anæmia, shortening of breath, and fluid in the abdominal cavity Captain Tucker thinks that usually the fluid is less in amount than in cases of alcoholic cirrhosis, it may be so, but usually it is fairly abundant In some cases the fluid does not recover after tapping and improvement in the general health takes place, but generally only for a time, in most cases the patients return to hospital with symptoms of profound debility and emaciation, and the late toxæmia to be seen in other forms of cirrhosis In a few weeks they get into a comatose state and die

On *post-mortem* examination the most prominent object is the enormous spleen, with much thickening and "mother of pearl" patches The liver is small, but the shrinking is not so extreme as in alcoholic cirrhosis The surface is finely granular, not "hobnailed," here and there there are smooth patches The liver being dragged down by the weight of the spleen can generally be felt, during life, below the edge of the ribs in spite of its being shrunken It shows the remains of adhesions and thickening of the capsule The blood is thin, the red corpuscles are only about one and a half to two millions "Malarial parasites are never found (says Captain Tucker) in the peripheral blood, nor are they found on splenic puncture during life"

Cases which represent the half-way stage of the condition are met with, with acute splenitis or hepatitis In such cases the benign tertian parasite has usually been found in Bombay in the peripheral blood The kidneys are generally fibrous and tough on section during life, the urine often contains a little albumen and the *sp gr* is low

Captain Tucker sums up his article by saying that "malarial cirrhosis is a complex condition of which hepatic disease is the terminal event Ascites is late and may be only slight In the early stages the liver is a little enlarged and in the later stages the organ is not very small The finely granular surface is quite distinct from hobnailed liver The cirrhosis results from repeated attacks of malarial hepatitis and capsulitis, associated with perisplenitis and a plastic peritonitis"

All medical men will recognise the cases above described, and these cases have usually

been ascribed to malaria, that is, to the late results of persistent malaria.

Much yet remains to be done as regards these late sequelæ of malaria, and their exact relationship to the malaria parasite or possibly to the Leishman-Donovan body still needs investigation. Such cases are very common in every hospital and dispensary in India and the opportunity for investigation is at hand.

THE ROLE OF FILARIA IN ELEPHANTIASIS

It is generally recognised that the etiology of Elephantiasis is not altogether covered by the filaria and the mosquito, and we have never seen any really satisfactory of the great immunity enjoyed by Europeans who live in places like Cuttack and Madras, where elephantiasis is a very common disease of the native inhabitants.

Some time ago, at a meeting of the *Society of Tropical Medicine* in London, Dr. T. Prout read a paper which threw doubt on the commonly assigned rôle of the filaria in the production of elephantiasis, and at a more recent meeting, Sir Patrick Manson discussed this subject. He first pointed out that both in tropical and non-tropical Elephantiasis the immediate cause was the same, viz., lymphatic obstruction, but the agencies which produced the obstruction were various. Manson had always claimed that these affections were common in the tropics because the obstruction was brought about by the common tropical parasite, the filaria of Bancroft. The proofs relied on were threefold: first, the endemic, or the identical geographical distribution of the parasite and the disease, but Manson went further and claimed also an identical local distribution and an identical racial distribution. The relationship of the parasite to the disease was most intimate: "the adult filaria had often been found, its young were nearly always found in the particular lymphatic fields affected." Is this accidental or did the diseased tissues attract the worms as a dunghill attracts sparrows? In a community in which the parasite was present in only 9 per cent it was present in 80 or 90 per cent of the subjects of chyluria, lymph scrotum or varicose groin glands. In regard to tropical elephantiasis (that is, of the legs, etc.) Manson admitted that the case was not so convincingly demonstrated. Cases had been published in which genuine scrotal elephantiasis had supervened on lymph scrotum, and in which elephantiasis of the leg had supervened on the removal of a lymph scrotum.

He maintained that the filaria sometimes died out and was a cause of lymphangitis, and lymphangitis was a constant and recurring feature in the history of elephantiasis cases. Then, he had suggested the plugging of the lymph channels by the ova of aborting worms. This might well be the first step in starting the lymph stasis (which on the *supervention of a bacterium*) induced lymphangitis, ending in true

elephantiasis. Koch's tests were not applicable, elephantiasis and elephantoid diseases were sequelæ rather of long antecedent germ infection. They stood in the same relation to the original cause that dropsy did to the germ of rheumatic fever, or a urethral stricture to the gonococcus.

The etiology of elephantiasis of the leg or scrotum is a subject to again be taken up by the tropical pathologist.

There is no doubt that the evidence connecting the filaria with elephantiasis, though strong, is not "complete or absolutely convincing," and we commend the subject to pathologists. Sir P. Manson's theory has held ground for a long time, and it is time for a younger generation of pathologists to again investigate the case afresh.

THE ROYAL SOCIETY OF MEDICINE

ONE of the results of the recent amalgamation of a number of Medical Societies in London into the Royal Society of Medicine has been the publication monthly of the *Proceedings of the Royal Society of Medicine*—published by Longmans Green & Co.

We have before us Vol. 1, No. 6, which contains a valuable lot of articles, e.g., 4 clinical cases, 11 dermatological cases, 2 electro-therapeutical papers, 4 papers in the epidemiological section, including one very valuable one on the subject of 'typhoid carriers' (This shows that there is danger of this theory of typhoid causation being overdone, and some of the instances which have been published are highly fantastical.) There are 16 papers in the laryngological section, two in the medical section, 18 in the neurological section, 7 in the gynaecological, 4 in the odontological, 10 in the otological, 6 in the pathological, one in the surgical and one in the therapeutical section. Each volume is handsomely printed. The successive volumes will certainly form a most valuable record of current medical opinion.

IPECACUANHA IN THE PRESUPPURATIVE STAGE OF LIVER ABSCESS

ONE of the most remarkable advances in the treatment of liver diseases in India and one of the most valuable chapters in Major Leonard Rogers' "Fever of the East" is his method of preventing the formation of liver abscess by the exhibition of ipecacuanha.

In a recent lecture given before the Calcutta Medical Club, Rogers gives a full account of his methods and cases.

We quote the following interesting remarks from the conclusion of his lecture—

"I have now laid before you the researches and reasoning which have led me to the conclusion that amœbic abscess of the liver is an easily preventable disease, if the affection is recognised in the presuppurative stage and treated promptly with full doses of ipecacuanha, and I have shown you that the method has met with uniform success for over two years in the

European Hospital, while recently several equally striking results have been obtained in the Medical College Hospital. It only remains for me to point out that this treatment has the further merit of not being new. More than twenty years ago, it was recommended in hepatitis, actually in order to prevent the occurrence of suppuration in the liver, by two of the greatest physicians who ever came to India, no less personages than Surgeon General Maclean, for many years Professor of Military Medicine at the great Netley Army Medical School, now unhappily no longer in existence, and also by Dr Norman Chevers, whose *Commentary on Indian Diseases* remains the most remarkable storehouse of facts concerning modern medicine in India which has yet seen the light. They advised Ipecacuanha on empirical grounds, but unfortunately it has fallen largely out of use. I venture, however, to hope that my researches will have placed the subject on a more scientific and lasting basis by the recognition of the amœba as the constant and sole cause of the disease, and the dependence of amœbic hepatitis on previous ulceration of the large bowel, commonly of a latent type and character, which is readily curable by ipecacuanha. The supply of amœbæ is cut off from the liver and the inflammation rapidly subsides, if abscess formation has not already taken place, while the value of the blood changes in allowing an early diagnosis to be made is also a great help. It appears strange that this treatment should have fallen so much into disrepute, but not so strange as the displacement of the cinchona treatment of malaria in Bengal by the terrible copious venesections and salivations by mercury during the first forty years of the eighteenth century through the pernicious teaching of James Johnson, and the reinstatement of quinine during fever by Edward Hare in 1847, who reduced the mortality from fevers in the European General Hospital of Calcutta twelve fold in one year by his methods, since universally adopted. And now history is repeating itself and I feel sure that the revival of the ipecacuanha treatment for amœbic hepatitis will continue to prevent the terrible tropical abscess of the liver in exact proportion to the promptness and efficiency with which it is administered, and one of the greatest scourges of hot countries will be very greatly reduced and should in time be practically exterminated.

The following medical officers passed the Examination in X Rays, Session February to April, at the Dehra Doon Institute.—

Major V E H Lindesay, I.M.S.
 Capt H Wetherall, R.A.M.C.
 Lieut S Haughton, I.M.S.
 Lieut D Graham, I.M.S.
 Lieut W S Mailes, R.A.M.C.
 Lieut A McNeight, R.A.M.C.
 Lieut J W Scott, R.A.M.C.
 C H Maichant
 A N DeGruyther
 C C O'Reilly
 A F Browne
 W Kirkpatrick
 J H Gleeson
 K P Basu
 S N Bannerjee

With reference to the article in our July issue (p 241) on The Value of Incinerators as a Means of Sewage Disposal, Surgeon General Hamilton, C.B., I.M.S., informs us that the introduction of these incinerators came just in time to save the Cantonment Funds the great initial

expenditure of 2,16,962 rupees for the establishment of a sewage farm for Rawal Pindi. This was to be paid back in 23 years with 4 per cent. interest, and it is evident that such an expenditure would have seriously crippled the resources of the cantonment. Compared with this, the cost of incinerators will be a mere trifle. We commend this fact to the authorities of other cantonments and municipalities, for in many municipalities we see no reason why the Rawal Pindi scheme should not work successfully.

WE have received two numbers of a new medical journal, entitled the *Journal of the Association of Medical Women in India*, which is printed for private circulation among members of the Association.

The editor is Dr K O Vaughan, Mussoorie, U.P., and D C Wickam of Rajkot is the Hon. Secretary and Treasurer to the Council of the Association. The Editor appeals in the February issue for support of members, and two ladies have guaranteed Rs 100 each for the Journal this year. The constitution and rules of the Society are published.

We wish the Association and its Journal every success.

AN officer writing from Tibet recently remarked: "It is extraordinary what an impression was made on the Tibetans by the surgical skill of the medical officers during the Mission. It has imbued them with a faith which makes them the best of patients, if even at times it is a bit embarrassing."

This is quite in keeping with the frontier traditions of the Indian Medical Service. Who was it that said long ago that the work of the I.M.S. officers on the frontier was worth a dozen regiments?

ON May 18th Sir Almroth Wright, M.D., F.R.S., was presented with the Fothergill gold medal at the annual *conversazione* of the Medical Society of London. The medal is awarded triennially to a medical man who has done exceptionally valuable work in some branch of practical medicine or surgery. In 1803 the first Fothergill medal was given to Edward Jenner.

MEDICAL officers on leave nowadays not infrequently go to the United States to visit some of the fine surgical and medical clinics there. It may be worth while to call their attention to the post-graduate course on tropical medicine which is held at the Philadelphia Polyclinic and Graduates' College. The course lasts for 12 weeks and there are three such each year. Partial courses can also be arranged for.

WE understand it is proposed to collect subscriptions for a memorial to the late Lt-Colonel

Peck We are certain that all his brother officers and many friends would gladly join

THE *Edinburgh Medical Journal*, for May contained a very complete résumé by Lt-Col W B Bannerman, M.D., FRSE, IMS, of recent researches into the etiology of plague "whereby it is shown that the rat-flea is the cause of plague epidemics" in India

DR STEPHEN PAGET is said by the *Transvaal Medical Journal* (April) to be the author of the book so favourably commented on in the press, entitled *Confessio Medici*

THE Director-General, IMS, desires us to call attention to the Medical Congress to be held in Melbourne from 19th to 24th October 1908. Any Medical Officer thinking of taking leave to Australia this autumn should communicate with the Director-General, I M S, Simla. The Committee of the Australasian Medical Congress will be glad to welcome any Medical Officer from India.

Reviews

The Diseases of Children, a Work for the Practising Physician—Edited by PFAUNDLER and SCHLOSSMANN. English translation by H L K SHAW, and L LA FETRA, with Introduction by Dr L EMMETT HOLT of New York. In 4 large vols. 61 full Plates and 430 text cuts. Philadelphia and London: J B Lippincott Company. Price 4 guineas net (sold in sets of 4 vols. only).

THIS magnificent and truly monumental work is evidence of the great advances made of recent years, especially in the United States, in the study of the diseases of children.

In the introduction to the first volume Dr Emmett Holt, the well-known Professor of Diseases of Children in Columbia University, New York, shows how the great advance in the study of these diseases has been attended by very great practical results. In New York City, for example, the mortality of children under five years has been reduced from 1,160 per hundred thousand (why not use the expression "per lakh?") to 620, in the town of Rochester (New York) the mortality rate has fallen to 340 from 584, and he calculated that there has resulted an annual saving of the lives of no less than 12,000 children, under 5 years of age, in New York City alone.

This Dr Holt attributes to the newly acquired knowledge of the hygiene and medical treatment of children, and to the dissemination of this knowledge among the general public.

This great work consists in its English dress, of four large volumes of over 430 pages each.

The following synopsis of its contents will give our readers some idea of the contents of this book of reference.

Hamburger of Vienna treats in 20 pages of the general pathology of childhood, Dr Pfandner of Gratz devotes over 200 pages to a most elaborate and complete analysis of the symptomatology of children's diseases. Bendix of Berlin treats of general prophylaxis, Neumann of general therapeutics, Piansnitz of morbidity, 37 pages are devoted by Raudnitz of Prague to the subject of milk, 50 more pages are given to the metabolism and nutrition of the first year. The second volume is devoted to special diseases, *eg*, 80 pages on the diseases of the newborn, 20 on the diseases of puberty, 24 pages to rickets, 25 to measles, 52 to scarlet fever, 18 to chicken-pox, 7 to vaccination, 6 to dysentery, 23 to whooping cough and 44 to tuberculosis. The third volume treats of other diseases, *eg*, 60 pages to the mouth and throat, 63 pages to abdominal diseases, and 12 to appendicitis, 21 pages to animal parasites, 11 to poisons, 102 pages to the respiratory tract, 22 to the larynx, etc, etc. The fourth volume has 111 pages on diseases of the genito-urinary system, 12 on the brain, close on 300 pages on the affections of the nervous system, 80 on skin diseases.

We cannot attempt a critical review of this great work. The above synopsis indicates very briefly the subject-matter of these volumes.

The book is scarcely one for the ordinary medical man in this land of transfers, but it is a book to be kept for reference in every library, and we believe it will long remain the standard book of reference on diseases of children.

Public Health Laboratory Work—By H R. KENWOOD and W G SAVAGE. Fourth Edition. London: H K Lewis, 1908.

THIS is the fourth edition of a well-known volume of "Lewis's Practical Series." The subject-matter has been revised and largely re-written, and the portion dealing with public health bacteriological work has been added by Dr W G Savage, whose own book on the bacteriology of water supplies we reviewed very favourably some time ago.

The present volume is intended for the public health student and will be found very useful by medical officers at home on leave, who are working for that most useful diploma, the D P H.

The first 126 pages of this book is taken up with the chemical, microscopical and physical examination of water for public health purposes.

Part II treats of the analysis of sewage and of sewage effluents, and gives a modification of Kjeldahl's method of estimating organic nitrogen and Letts and Blake's process for the estimation of the dissolved oxygen. The author recognises that a chemical standard applicable to all cases is "neither possible nor desirable. The best possible results must be aimed at . . . but certainly all effluents should conform to the

following requirements. They should contain but very little suspended organic matter (certainly below 5 parts per hundred thousand), they should possess no sewage odour and should furnish no physical evidence of putrefaction when they are incubated for three days in a closed vessel at 27°C."

Part III gives a brief and clear account of soil examination. The fifty-three pages devoted to an analysis are excellent, as also is Part V on food examination, milk, butter, cheese, laid, bread, meat, alcoholic beverages, vinegar, lime juice, tea, coffee, arsenic in food and in wall paper, tinned foods, etc. As regards tea, this is now but little adulterated, owing to its cheapness. The remarks on antiseptics and colouring matters in preserved food are good and the regulations of the Local Government Board in 1906 are quoted, and an excellent account is given of *harmful* colouring agents as lead, arsenic, copper, mercury, iron, prussic acid and, of the *harmless* colouring agents, as cochineal, madder, beetroot, annatto, turmeric, saffron, and a few of the anilines (fuchsine, magenta orange). Annatto is a much used colouring matter and is obtained from the seed of a plant called *Bixa orellana*.

Part VI deals with disinfectants, and it is pointed out that many carbolic preparations have too little carbolic or cresylic acids to make them valuable. Dr. Savage's chapters on the bacteriological examination of water are excellent and well illustrated, as are also those on food, soil and air. The bacteriology of cholera, plague and anthrax is also described.

The whole book is a good one and admirably adapted to the needs of the public health student for use as a Laboratory manual. It is excellently illustrated.

The production of Alkali in Liquid Media by the Bacillus Pesticus.—By Lieutenant-Colonel W. B. BANNERMAN, M.D., B.Sc., I.M.S. Scientific Memoirs, 1908, No. 33 (new series).

LIEUTENANT-COLONEL BANNERMAN, I.M.S., the Director of the Bombay Bacteriological Laboratory, publishes a highly technical note on an explanation of the fact that plague microbes cease to grow abundantly in liquid media after a month or six weeks. This fact has hitherto been explained by the supposed consumption of all the available nutriment. In the Bombay Laboratory it was found that the medium in old sterile flasks had become alkaline (2 to 2.5 per cent of normal alkali), and this has been proved to be the case by the series of experiments reported in this monograph.

The Golden Rules of Venereal Disease.—By C. F. MARSHALL, M.D., F.R.C.S., "Golden Rules" series, No. XVII. Bristol: J. Wright & Co.

THIS little booklet, of the size of a pocket note book, is a wonderful epitome of all that it is essential to know on venereal diseases. The author, Dr. C. F. Marshall, is well known as the

author of a standard work entitled "Syphilology and Venereal Disease."

In such small space "Waistcoat Pocket Size" and price 1s., it is simply marvellous how much is contained. It is eminently practical and most of the leading facts are compressed into this small space. For the busy medical officer such a booklet will prove useful in refreshing his memory.

Keen's Surgery, Vol. 2. W. B. Saunders and Co.

THE surgery of the bones, joints, muscles, lymphatics and nerves is the subject-matter of this heavy bulky volume which, like its predecessor, consists of a series of condensed monographs by well known authorities in the States. As is inevitable in such composite work, the different parts are of very unequal merit. Professor Keen might have been more fortunate in his choice of a writer on the lymphatics who feels equal to disposing in two lines of Ludwig's theory of lymph flow, equal also to writing authoritatively on elephantiasis when his practice is in the province of Maine.

Professor Nicholl of Harvard is responsible for two lucid pathological papers which bear evidence of the quality of the teacher and the critic. Might we suggest that he is hypercritical when he refuses a place to Acute Periostitis which he would class as a superficial osteomyelitis. It would be equally justifiable to abolish dermatitis because it is always accompanied with some subjacent inflammatory trouble.

We can strongly commend the two articles on fractures and dislocations contributed by Dr. Eisendrath of Chicago. They are models of clear exposition and are abundantly and beautifully illustrated, as is indeed the entire volume. Probably no recent writer has so fully yet concisely dealt with these subjects, and we would draw special attention to the extensive use made of radiograms and also to the detailed description given of the various modes of treatment. All Eisendrath's recommendations are imbued with a wise conservatism, and it is much to be regretted that it is for many reasons impossible in this country to follow some of the methods he advises. In this connection it is worth noticing that the Lorenz bloodless operation seems now to stand condemned in the States after having been put to the test for some years.

Dr. Lovett of Harvard contributes an excellent article on the joints, but his still more valuable contribution to this volume is the article on orthopaedics, a subject for which his experience at the Boston Children's Hospital eminently qualifies him. The publishers are to be thanked for having made possible the extensive use of illustrations with which this article is enriched.

Professor Spiller's article on the Pathology of the chief surgical disorders of the nervous system is an excellent prologue to Dr. Woolsey's articles on the surgery of the nervous system and the spine.

An exceedingly good article on Neurasthenia and allied troubles is the last valuable contribution to the volume.

Every article is enriched with an excellent bibliography. The catholicity of the knowledge and reading which have gone to the making of this volume may be estimated by the fact that even the work of the Calcutta Medical College Hospital comes under reference in the shape of a case reported by the Hon'ble Colonel R. D. Murray which, we believe, was illustrated originally in this Gazette.

The publishers have done their duty generously, too generously we should say, for the wants of this country. A beautiful print and splendid illustrations appeal to us, but it is hopeless to expect an extensive sale in this country for books that it is a burden to handle. For the Indian market it was surely possible to produce these volumes printed on a light India paper.

The Bacteriology of Diphtheria, including Sections on the History, Epidemiology and Pathology of the Disease, the Mortality Caused by it, the Toxins and Antitoxins and the Serum Disease—Edited by G. H. F. NUTTALL and G. S. GRAHAM-SMITH. Cambridge University Press, 1908. 25s. net.

THIS fine volume of 700 pages contains a full account of this difficult subject by authoritative writers, and sums up the present knowledge in an admirable manner. It is intended for bacteriologists and health officers, and will save them much labour in searching the immense literature on diphtheria for special points. It includes articles by Loeffler on the history, A. Newsholme on the epidemiology, Mallory on the pathology, Graham-Smith on the bacteriology, a very full and well illustrated account, which occupies about half the entire volume, Dean on immunity and toxins and antitoxins, a well-written account of an extremely difficult subject, and Park and Boldau on the mortality and serum sickness. A full bibliography is appended as well as a good index. The marked reduction in the case mortality of the disease since the antitoxine came into general use is well brought out in the opening section. The vexed question of the relationship of Hoffmann's pseudo-diphtheria bacillus to the true organism is fully discussed, and the teaching of the most recent investigations to the effect that they are quite distinct organisms is endorsed. This book may confidently be recommended to those for whom it is intended, and we hope that the promise of similar works on other diseases, if the present meets with a favourable reception, will soon be fulfilled.

Principles and Practice of Modern Otology—By JOHN F. BARNHILL, M.D., and ERNST DE WOLFF WALES, B.S., M.D. Pp. 575. Illustrations. 30s. Publishers: W. B. Saunders and Co.

THE first 62 pages are taken up with the anatomy of the ear. It is a curious omission that no connected description of the tympanic

cavity is attempted, though every other part of the ear is so described. A short chapter on the physiology of the ear is followed by others on its bacteriology and on the causation of its diseases. The diseases themselves are the subject of the rest of the volume. Malformations, diseases and injuries of the external ear are the first subjects to be taken up and then consideration occupies 80 pages. In taking up that of the methods of physical examination, difficulties which may be met with and the ways of overcoming these are a useful feature of a useful chapter. After describing the examination of the function of the ear, considerable emphasis is laid on the influence of nasal and nasopharyngeal diseases upon affections of the ear, and full details of the diagnosis and treatment of adenoids are included, in view of the detrimental effects of their presence on the hearing. The next object for discussion is the tympanic membrane, and after that the diseases of the middle ear. The acute inflammations are divided into three grades, acute tubo-tympanic catarrh, acute catarrhal otitis media, and acute suppurative otitis media. A very emphatic position is given to acute mastoiditis and its treatment. In chronic purulent otitis media the author favours thorough cleansing and the institution of "dry treatment" as being the line which usually is successful, though he recognises that in certain cases ear drops are more useful. It is, of course, on chronic mastoiditis and its sequelæ that the greatest attention is concentrated, these chapters are very good, and if one part of them had to be put in front of another, it would be the operative procedure, by reason of its lucidity. The extension of an otitis media to the labyrinth is also pressed on the attention, and other labyrinthine diseases are suitably dealt with. A chapter on deaf-mutism ends a useful book. The illustrations and printing are very good.

ANNUAL REPORTS

THE KING INSTITUTE, GUINDY

DURING the year 1907 Captain S. R. Christophers, I.M.S., the Superintendent of the King Institute, Madras, was on special duty in connection with the blackwater fever investigation in the Duars, and Captain W. S. Patton, I.M.S., acted as Superintendent.

During the year 1893 specimens were examined, among these were a number of plague specimens, tumours, parasites, water samples, etc. We quote the following interesting note on malaria—

Two hundred and sixty-six specimens of blood for the detection of the malaria parasites were received and reported on. In last year's report the necessity of the estimation of the endemic index of different localities was pointed out by Captain Christophers, and during this year in only one instance from Maymyo, Burma, was it possible to work out the endemic index which was 71 per cent. In Volume I of the special studies connected with this report will be found a paper (No. IV) by Assistant Surgeon T. Seethapathy Iyer, I.M.S., and Assistant Surgeon K. Srinivasa Raghava Iyengar, I.M.S., which gives an account of some investigations into the malarial fever prevalent in the villages along the Buckingham canal. This district has long been notorious for a very violent form of malaria which dates back to the years 1902–1904 when the present railway was constructed. Large numbers of coolies from Cuddapah were employed in this work and presumably they were infected with the form of

malignant malaria from that district. The excavations of pits along the railway line together with those in the cashuana plantations undoubtedly increased the breeding grounds of *Anopheles* mosquitoes. Since then there are constant outbreaks of severe malaria, and the once fashionable watering place of Ennore (Kathirawakum) has been entirely deserted. The unhealthiness of Kathirawakum is of peculiar interest to the Revenue Board as it is the head quarters of the Assistant Commissioner, Salt Department, Chingleput Sub division, and of the Inspector Ennore Circle. These officials have been obliged to abandon their quarters, as almost everyone who lives in them contracts a very serious type of malaria which is on the verge of life. The fever season begins about the end of November and often continues with great severity up to May. In September 1907 I had the opportunity of visiting this place with the Sanitary Commissioner. A careful search was made for *Anopheles* mosquitoes and the harmless species *rossi* was alone found. It was at once evident that quite half, if not more, of the population of these villages had suffered from malaria and 8 per cent of children had parasites in their peripheral blood. As this was not the fever season it was impossible to form an adequate idea as to what the conditions are in the months from January to May. Many recommendations have been from time to time suggested but unless a thorough investigation of the exact breeding grounds of the particular species of *Anopheles* be made during the whole of the fever season, and an exhaustive study of other conditions favouring its propagation together with a careful study of the disease, it is impossible to formulate any measures which would with certainty render this district healthy. It therefore offers an excellent opportunity for the Government to test scientifically antimalarial measures."

We quote the following note on the work done in Protozoology during the year—

"Our knowledge of the pathogenic and non pathogenic protozoa has advanced considerably during the year. To the three great epoch making discoveries in the history of protozoology, the discovery of the malaria parasite by Laveran, the discovery of *Plasmodium bigemini* by Smith and Kilbourne and the *Nagana* *trypanosome* by Bruce, may well be added the late Dr. Schaudinn's remarkable memoir on the life cycles of *Trypanosoma noctuae* and *Spirocheta ziemannii*. This latter work has undoubtedly stimulated further research not only into the flagellata, spirocheta and allied organisms but on protozoa in general. In the near future therefore important discoveries of great practical use may with certainty be anticipated."

"In last year's report a short résumé (Appendix VI) of the work done on the development of the Leishman Donovan body in the bed bug *Cimex rotundatus*, was given and the Memoir describing those changes will be published shortly. It will be remembered the parasite was traced from its early development up to the formation of the mature flagellates, and further a second process of division was observed. In a paper attached to the present report (Volume I, No. V) it will be seen that it is probable the parasite passes back to its non flagellate stage in the bug and is thus reintroduced into man. It has not been possible yet to definitely settle this point, as cases of Kala Azar suitable for feeding experiments were not procurable in the General Hospital Madras."

"The biological position of the Leishman Donovan body is still a disputed point. Roger's suggestion that it is related to *Herpetomonas*, a group of insect flagellates, depended on the fact that in its flagellate stage it has no undulating membrane, the flagellum projecting freely from the anterior end. The characteristic human stage has however been the obstacle and until it is recognised that these insect flagellates have a similar stage the exact position of the parasite of Kala Azar will not be understood. The life histories of these flagellates of the genus *Herpetomonas* are therefore being studied and recently a species named *Herpetomonas lygeri* has been found in the alimentary tract of *Lygus militaris*. The fact that this parasite is almost identical with the Leishman Donovan body undoubtedly suggests that the parasite of Delhi Boil is a distinct species and is in no way connected with the well known parasite of Kala Azar as some authorities believe. Many *Herpetomonas* are almost indistinguishable in their non flagellate stages and can only be separated when their complete life cycles are studied. A full description of *Herpetomonas lygeri* will appear in due course in the *Archiv für Protistenkunde*."

An important memoir on the complete development of *Protoplasma canis* in the tick *Rhipicephalus sanguineus* by Captain Christophers I.V.S. a short résumé of which was given in last year's report (Appendix V) has recently been published. This work clearly shows that *Protoplasma canis* has no flagellate stage an important point, as considerable doubt still exists as to the biological position of the *Protoplasma*. Miyazima has however, recently announced that *Protoplasma parvum* has a flagellate stage, he states that by cultivating the blood of an infected animal on nutritive

bourillon, after three or four days large flagellates which were indistinguishable from *trypanosomes* made their appearance. He further states that no *trypanosomes* could be found in 200 crotches examined by him, and that success was obtained with a single drop of blood which could be readily examined in its entirety, and that the presence of flagellates depended on the presence or absence of *Protoplasma parvum* in the blood. At first sight these results would appear convincing, but it should be remembered that adult *trypanosomes* may be missed in ordinary blood films (cf. Noy and MacNeil's results with the *trypanosomes* of birds). Another important point is that the *trypanosomes* may have been present in the blood of the cattle in another stage, and this is certainly suggested by the recent observations of Moore and Bierni on *Trypanosoma gambiense*. These observers have found the non flagellate stage of this *trypanosome* in animals inoculated with the parasite, a similar stage may quite well occur in the blood of animals infected with other *trypanosomes*. Until the life history of *Protoplasma parvum* is traced out in the tick, these observations of Miyazima must be accepted with some reservation."

A new species of Mammalian *Haemogregarine* has been discovered in the blood of the South Indian hare *Lepus nigricollis*. It is proposed to name it *Leucocytozoon leporensis*. This parasite is shortly described in Volume I, No. VI. Further observations have also been made on *Leucocytozoon funambuli* its method of reproduction in the squirrel *Funambulus pennatus* has been found to take place only in the lungs of the animal. This cycle which is shortly described in Volume I, No. VI, clearly shows that although the parasite is related to the *Haemogregarines* of cold blooded animals, its life cycle in the squirrel is unlike that of such well known forms as occur in snakes."

Four if not five Bacteraean *Haemogregarines* (vide Volume I, No. VII) have been found to be common in *Rana tigrina* and *Rana hecadactyla* from certain ponds and tanks which also contained two species of leeches, one a *Cleopatra*. The leeches have been sent to Professor Blanchard for identification. These frogs were also found to be infected with *Trypanosoma rotatorium*, *Trypanosoma laryzeukton* and a small species somewhat similar to *Trypanosoma belli* (vide Volume I, No. VIII). Development of these *trypanosomes* has not been observed in the leeches and it is not yet certain whether the leeches have a natural flagellate in their alimentary tracts."

Further observations on a number of *Ophidiu* *haemogregarines* are also being conducted. This work has so far shown that snakes belonging to widely different genera from this part of India are infected with a single species of *Haemogregarine*. This has been confirmed by the study of the method of reproduction of the parasites in the lungs of the snakes. The making of new species on the examination of stained films of the peripheral blood of snakes, particularly when they are from the same locality, is therefore hardly justifiable."

A *trypanosome* has been found in the blood of three fresh water fish from the river Adayan, *Phoxoprus maculatus* (Bloch), *Gobius giuris* (Ham. Bech) and *Rhyrobella aculeata* (Bloch). *Trypanoplasma* have not been found in any fish."

A *coccidium* has been found in the alimentary tract of *Emys graeca* nearly every specimen of this tortoise is infected with *Haemogregarina moosa* (Castellan and Willev). Another small *coccidium* was found in the alimentary tract of *Lygus militaris*. It is of some interest as these *sporozoa* have so far not been recorded from the *Rhyrobella*."

Cimex rotundatus.—Specimens of this bed bug were sent to the Institute from Angola, West Africa, by Dr. Wellmann. A number of specimens of the same insect were also received from Sierra Leone through Dr. J. W. W. Stephens, these facts suggest that this bed bug is widely distributed in Africa. The occurrence of Kala Azar in certain districts of the Soudan, Sennar Province and Wadi Medani as recently pointed out by Dr. Balfour, should direct attention to the presence or absence of the bed bug *Cimex rotundatus*. In view of the fact that a large number of the *Rhyrobella* are infected with harmless flagellates I have examined the alimentary tracts of about 200 living specimens of *Cimex rotundatus* from all parts of India, Burma and Assam as well as those of some hundreds from Madras. I have failed so far to find any natural flagellates in this bed bug. A few specimens of *Cimex lectularius* from Northern India, London and China have also given negative results."

Post-graduate work for Assistant Surgeons and Civil Hospital Assistants appears to be in a more advanced state in Madras than in any other province in India. Sanitary Inspectors are now given a course of instruction, and Vaccinators and Plague Inspectors also. There is a course of instruction in the bacteriology of vaccine and the principles of asepsis in human and animal vaccination and demonstration on the common diseases of man and animals. This is excellent, and we should be glad to see the medical schools in other provinces make provision for the post-collegiate teaching of the two classes of Assistant Surgeons and of Hospital Assistants."

An appendix to the report of the King Institute gives a valuable study by Captain Christophers on the comparative value of *Pesterine* and other flea destroying substances.

He experimented with "Crude oil emulsion" which has been widely recommended by the Government Entomologist. It cost Rs 6 14 0 per gallon, exclusive of carriage, it is a soft soap like jelly, but Captain Christophers has not found it effective. The emulsion called by Dr Turner of Bombay *Pesterine* was found "effective" in dilutions of 1 in 10 and 1 in 25. "Plunas," another kerosine oil emulsion, costing Rs 3 8 per gallon, is satisfactory but expensive, and Captain Christophers has devised an emulsion in the Laboratory equally effective and far cheaper. The formula for making Christophers' "Emulsion A" is as follows —

Formula for making Emulsion A — To each four cakes of sliced sunlight soap add half a gallon of water and boil until all the soap is dissolved.

Formula for omeigent use only when sunlight or other good cheap soap not available —

(a) To half gallon water add 1 viss country soap, and boil until this is dissolved.

To half gallon of the resulting solution add oil as in Emulsion A, beating up vigorously between the additions. After the addition of two gallons over saturation will be quickly reached.

(b) To half gallon water add 2 bars Golden bar soap and boil until dissolved. Proceed as above but add 2½ gallons oil.

The addition at which Emulsion A should be used requires some consideration. There is every reason to believe that a 1 in 25 dilution would be extremely effective, but to ensure absolute certainty it would be better, as the cost is so small, to employ a 1 in 10 dilution. In this strength no flea touched with the fluid appears to have a chance of escape.

The cost of the substances tried above per gallon of effective solution is as follows —

Substance	Dilution considered effective	Cost per gallon	Cost per gallon of effective solution	Cost of 100 gallons of effective solution	REMARKS
		Rs As P	Rs As P	Rs As P	
<i>Pesterine</i>	Undiluted	0 4 0	0 4 0	25 0 0	Exact price not known
<i>Pesterine</i> emulsion (unsaturated soap emulsion)	1—10	0 8 0	0 0 9 6	5 0 0	Disadvantage of being very foul compared with Plunas and kerosine emulsion
Crude oil emulsion	1—10	1 6 0	0 2 2	13 12 0	Very doubtful if effective as stated at 1 in 10
	1—25	3 5 0	0 2 3	14 0 0	
Plunas	1—10	3 8 0	0 5 6	35 0 0	Effective on momentary contact
	1—25	0 5 0	0 0 3 4	2 0 0	
Emulsion A	1—10	0 8 0	0 0 9 6	5 0 0	Effective on momentary contact

Pour half a gallon of the solution still hot into an open tub tilted to allow the fluid to be beaten up with a coconut spoon such as in general use by natives. Whilst stirring or beating up add oil point by point at intervals of about a minute, seeing that all trace of free oil is absorbed into the frothy mass before fresh oil is added. After the addition of about three gallons go very carefully. If properly done, one half gallon of soap solution should emulsify a whole tin of kerosine containing four gallons. The only error likely to be made in the first attempt is that from inefficient stirring or too quick addition of the oil premature over saturation should occur, a fact which is at once apparent to the maker. To make one brew of four gallons takes about half an hour. It would be desirable to have a couple of coolies to each tub to take turn about at stirring and pouring the oil. Each couple of coolies should turn out at the very least four brews per diem, in actual practice they will probably be able to turn out much more.

The cost of Emulsion A works out as follows —

	Rs As P
Cheapest oil of yellow colour, 4 gallons (1 tin)	1 8 0
Soap, 4 cakes of sunlight soap	0 5 0
Labour	0 2 0
Cost of firewood, etc., say	0 1 0

making 41 gallons at 2 0 0 or under Rs 0 8 0 per gallon

The emulsion would be best turned out from some central source where the product could be guaranteed, but there is no reason why any one should not produce this substance locally if required. If made at head quarters, there is, of course, the cost of distribution to be considered, but on the other hand, this has probably to be paid in the extra price of oil in the mofussil. It is also probable that the cheaper kinds of tank oil may not be available in distant places and the superior kinds of oil besides being much more expensive may not be so effective.

In cases where it is found impossible to get the prepared emulsion or even sunlight soap for making this the following two formulae for making emulsion with country soap and golden bar soap can on emergency be used. But the use of country soap is not recommended, it will necessarily make the solid emulsion which requires more care in manufacture than Emulsion A, and an excessive quantity of alkali in the soap may at any time give rise to difficulty, the emulsion being liable to become curdy and not to mix well with water. The "Golden bar" formula is the better of the two.

THE MADRAS MATERNITY HOSPITAL

It was only in our April, 1907, number (page 141) that we noticed the 1906 Report of the Government Maternity Hospital, Madras. The Annual Clinical Report for 1907 (dated May, 1907) is now before us, and as it is always a report of interest, we here give extracts from it.

There were 2,000 deliveries of which 49 died, of which 22 died from accident of childbirth (eclampsia 4, rupture 10, short 6, etc.), 5 from puerperal sepsis, and 22 from non puerperal causes.

The following table shows the proportions of primiparae and multiparae —

Ages of women—Years	14 to 19	20 to 24	25 to 29	30 & above	Total
Number of women—					
Primiparae	258	260	46	9	573
Multiparae	42	512	425	445	1 427
Total	300	772	471	457	2,000

The deliveries may be thus classified —

Natural labour	1,333 or 66.65 per cent
Difficult do	269 „ 13.45 do
Preternatural labour	71 „ 3.55 do
Complex	260 „ 13.00 do
Abortions	67 „ 3.35 do
Total	2,000

There is a comparative increase under natural, difficult preternatural and complex labours and a falling off under abortions.

The following shows the general classification of the 2,000 confinements —

Delivery at full term	1,684
Do before full term	225
Do of macerated or putrid children	24
Abortions	67
Total	2,000

Mode of delivery in laborious labour	Number of cases	MOTHERS		CHILDREN ALIVE		CHILDREN STILL		PERCENTAGE OF MORTALITY	
		Recovered	Died	Male	Female	Male	Female	Mothers	Children
Induction of labour	1	1			1				
Forceps	236	232	4	120	91	7	6	1.69	4.71
Cephalotripsy (1 perforation)	2	1	1			1	1	50.00	100.00
Podalic Version (1 forceps to after coming head and 1 perforation)	8	8		2	3	2	1		37.5
Cephalic Version	1	1		1					
Crianiotomy and perforation	1	1					1		100.00
Perforation	6	5	1			3	3	16.66	100.00

These were labours complicated by some accidental occurrence, involving danger either to mother or child. Of these there were 260, an increase of 4 compared with the figures of 1906 —

Plural births	22
Hæmorrhage	35
Retained placenta or membrane	17
Puerperal eclampsia	17
Rupture of uterus or vagina	10
Pro lapse of funis	28
Other complications, such as dysentery, fever, pneumonia, valvular disease of heart, albuminuria, etc	133

Total 260

(a) Plural births

Twenty four women were confined of twins. Two were included under abortions.

In the remaining 22 cases 37 children were born alive —

Males	21
Females	16
Total	37

Seven children were born still, viz —

Males	3
Females	3
Putrid—Female	1
Total	7

Of the 25 twins { 10 were male pairs
8 were female pairs
4 were mixed pairs

We quote Major Giffard's remarks in full —

During this year the hospital has been in the hands of the Public Works Department, and building and alteration at a cost of over a lakh of rupees (£7,000) have been in progress. There has been some considerable difficulty in finding suitable accommodation for patients throughout the year as the workmen required that one or two blocks of buildings should be evacuated at the same time. It was considered best to have all the building alterations and electric light installation done at one time. In order to make this proceeding possible, the matron gave up her quarters and was provided with a small house outside the hospital. The dispensary, the office, the nurses' sitting room, nurses' dining room, medical officers and students duty rooms were temporarily located in glass-roofed hut huts in the compound and the patients were crowded together to some extent but never to a dangerous degree. Notwithstanding these inconveniences, the hospital was able to treat 4,537 patients as compared with 4,378 in 1906, and 2,057 women were delivered as compared with 1,878 in 1906. No accidents either of sepsis or hæmorrhage occurred which could be in any way attributed to the condition of comparative disorder and the constant shifting of the position of the delivery wards. The Superintendent considers that he may sincerely congratulate his staff on the result of the year's work. The hospital and nurses' quarters and the quarters of the Superintendent are now lit throughout with electric light and the old punkas have all been removed and electric fans installed in all the European wards and in both the main and septic delivery wards.

Below is a list of the new buildings and alterations —

(1) A large new operation theatre with nurses' room, anaesthetist's room and a verandah for students has been built over a new ward for ten beds in the middle of the south side of G block.

(2) The two centre cottages have been pulled down and a large new septic delivery room and labour ward attached have been built on the site.

(3) New latrines and bath rooms with English baths, white marble floors and white glazed tiled walls have been added to the A, B, D and E blocks of the hospital.

(4) Two new sterilizing rooms have been built at the ends of the main delivery wards on the ground floor of G block, and all the rooms of the ground floor of C block have been paved with white marble and the walls lined 6 feet high with white tiles.

(5) Behind the matrons' quarters, a new two storied house for the permanent nurses of the hospital has been built facing the Museum.

(6) The staircase in the centre of G block has been removed and is erected between C and A blocks, whilst a new staircase has been built between C and E blocks, and covered passages have been built connecting these with the covered way at the back of the hospital.

(7) A new verandah has been built around the old operation theatre and the theatre converted into a ward, and a new staircase at the north of G block has been built by the side of the old theatre.

(8) The main delivery wards have been supplied with a special supply of water from two new tanks fitted on to the tops of the circular staircases at the back of G block and the water supply passed to the delivery wards through large Berkefeld filters.

(9) The accommodation for native nurses has been doubled and the kitchen for caste and non caste native pupil nurses has been built near their quarters.

(10) A strip of land 50 feet in width has been added to the hospital compound at the expense of the Museum compound.

(11) The laundry and drying ground has been surrounded by a high fence of wire netting.

(12) A new carriage porch and covered ways from the porch to the corners of B and D blocks has been built for the use of visitors, the old porch being now used by patients only.

Sanction has just been given by Government for the erection at the main gate of the hospital of a large out-patient room costing Rs. 35,000 (£2,300), one side of which has been constructed as a general dispensary for women and children to take the place of the old Egmore Dispensary and the other side for gynecological cases only.

Further improvements which it is proposed will be taken in hand this year are —

(1) Complete drainage system connecting up the hospital with the Corporation main sewer.

(2) Electric lift in the centre block and the provision of an administration block with accommodation for students.

As pointed out in last year's report we no longer refuse to take in cases that have been already delivered and who are septic. We hope that our arrangements for admission and treatment of such women are sufficiently perfect to ensure the safety of the other patients in this hospital. This procedure is of course inimical to statistics and morbidity rates, but very necessary for the relief of the large number of poor women who require immediate treatment after they had been rendered septic by the filthy practices of untrained and ignorant native barber hereditary midwives —

The morbidity rate for the whole 2,000 women delivered during the year works out at —

Queen Charlotte's Standard	24.2
British Medical Association's Standard	11.0
Foreign Standard	10.45

The rate for the 1,655 cases treated from the commencement of labour by this hospital is found to be —

Queen Charlotte's Standard	20.4
British Medical Association's Standard	9.06
Foreign Standard	7.82

and the rate for these 347 women who were examined, manipulated or otherwise treated by persons outside the hospital before their admission and sent to the septic side of the hospital is as follows —

Queen Charlotte's Standard	58.4
British Medical Association's Standard	23.4
Foreign Standard	13.32

The elevations of temperature which caused the morbidity among the 2,000 deliveries can be classified under the following heads—

Cause	NO OF CASES	PER CENT
Sapremia (mostly pueroral)	109	5.41
Malaria	92	4.6
Constipation	55	2.75
Chest, cough, etc	18	0.9
Retention	91	4.55
Doubtful	43	2.15
Intestinal	75	3.75
Urinary	4	0.2

It may be noted here that the greatest benefits have been found in septic cases to follow the gentle emetting of the uterus with a blunt flushing emetto (using weak Lysol solution) followed by the introduction into the uterine cavity of a thick piece of sterilized gauze ring out of pure (medicinal) Iodo. The gauze is left in the uterus for 6 hours, and although the caustic effect is very visible for ten days or more, there is often a startling suddenness in the recovery and so far, no harm has ever come from this procedure.

Lysol solution, 1 in 400 to 1 in 200, has slowly become the favorite antiseptic with the staff of this hospital in midwifery work, and is now used very extensively and almost to the exclusion of all other chemical antiseptics.

One woman suffering from rupture of the uterus received 2 pints of 1 in 200 Lysol solution into the peritoneal cavity, and this was poured out of her at the subsequent Poir's operation. The Lysol did no harm and she made a good recovery.

For the past 18 months *post partum* hemorrhage, occurring after the expulsion of the placenta, has been treated, whether in slight or severe cases (and since the introduction of this procedure there have been very few severe cases) by immediate elevation of the foot of the bed combined with manual pressure on the abdominal aorta as advocated by Dr. Bishop. This method of treatment has been found simple and effective and is very easily taught to the nursing staff.

Formerly, the assistant matrons in charge of the delivery ward made the admission notes on and generally were responsible for the diagnosis and treatment of all natural cases. The duty of taking the original notes and making the diagnosis has from the past year been entirely undertaken by the Assistant Surgeons on duty and a 'form' for the purpose has been introduced. This change has relieved the nurses of great responsibility and also has led to much greater accuracy in diagnosis and earlier surgical interference in abnormal cases. The result of the change has been that the number of occipito posterior presentation diagnosed has risen from 9 in 1906 to 150 in 1907, and another result has been that forceps were applied 101 times more often than in the previous year, as the rate of the fetal heart was more carefully watched and delivery effected as soon as the heart rate approached the danger point.

The hospital order book rule relating to the amount of vaginal examination to be performed by the staff has been in force since 19th July 1906. "In future, as soon as called to admit a maternity case, medical officers will note the following—

Pulse
Temperature
Tongue
Urine
State of bladder

By palpation—

Condition of uterus, etc
Condition of fœtus
Position of fœtus
Rate and position of fetal heart
Vaginal examination when considered necessary

If students or nurses are present, this routine method of examination will be explained to them and when the condition of the women will allow it, students or nurses will be allowed to examine the patient in this way for themselves. In future, routine vaginal examination will not be performed by the assistant matrons on duty, by students, nurses, or any one else until the writers have bled, when an examination will be made by the assistant matron, or any one she may depute, to see whether the cord has prolapsed or not, all other points which can be ascertained by vaginal examination should be noticed at the same time. If membranes have ruptured before admission, it shall be the duty of the medical officer to make a vaginal examination on admission. He may depute the assistant matron to do this. "During the course of labour no vaginal examination will be made except with some definite object in view and to ascertain some important fact that cannot otherwise be made out by external examination."

The hospital has recommended daily during the year from 10 to 15 pregnant women who were very near their confinement, or who were under treatment for some diseases of pregnancy. These women have not been treated in separate wards, but have been housed amongst the maternity cases.

No harm has come from this procedure and indeed is in some ways productive of good, as those patients, when fit to do so, move about among the mothers and help them with the infants. It is also a means of introducing a *primipara* to some of the methods of infant management and hygiene which she will shortly have to learn.

During the year the excellent system of giving a daily small money dole to poor pregnant women who are more than six months pregnant has been continued. This practice was instituted by the Government of Madras in 1844, and is much appreciated by the women who go home during the day but sleep at night in a special ward.

During the year 7,162 doles were given and the average number of recipients daily was 20.

Medical Society

MEDICAL SECTION OF THE ASIATIC SOCIETY

THE monthly meeting of the Medical Section of the Asiatic Society of Bengal was held on July 8th. Clinical cases were shown by Lieutenant-Colonel Harris (which will be published later), some X-ray negatives were shown by Captain Connor, I.M.S., and radiographs illustrating cases of special interest by Assistant-Surgeon A. A. E. Baptiste.

PROPOSAL FOR A MEDICAL REGISTRATION ACT FOR INDIA

The following motion was proposed by the Secretary of the Medical Section, with the permission of the Council—"That in view of the continued multiplication of unauthorised and self-constituted bodies granting licences and certificates to practise medicine, to the serious detriment of the Medical Graduates of the Indian Universities, the Medical Section of the Asiatic Society of Bengal is of the opinion that the time has fully come for the passing of a Medical Registration Act for India, Bards or Kabirajes and Hakimis not being interfered with." The proposer pointed out that this was an old suggestion, the late Surgeon-General Harvey having strongly urged its necessity in his presidential address at the Indian Medical Congress in 1894.

The motion was seconded by Assistant-Surgeon Rai Hira Lal Basu, Bahadur, who said that some of the bodies who were granting these so-called degrees had no apparatus for chemical teaching, and hardly any bodies to dissect, two complete courses of anatomy, which were supposed to include the dissection of the two bodies, being completed within three months. The bodies were multiplying by splitting up owing to internal dissensions, one having already given rise to three. He knew of one second year student who had left the Medical College owing to his having completely failed in his examinations, who completed three years' courses at one of these bogus institutions within six months, and gained a complete diploma to practise medicine at a cost of Rs. 400. Such a state of affairs should not be permitted in a civilised country.

Dr. Upendranath Bhamachari supported the motion, and mentioned the case of a student who had been turned out of the Campbell

Hospital, who got a diploma elsewhere within a few days. It was not only in Bengal that these institutions flourished, one having recently been started in Dacca. The Indian Universities only should be allowed to give licences to practise the European system of medicine, and no private bodies permitted to do so. Dr B. Ghosh also supported the motion. Lieutenant-Colonel Linkis said that action in this matter had become urgently necessary. There were now four or five self-constituted bodies giving these diplomas. With one exception they have neither directing rooms, laboratories, museums or libraries or hospitals, yet are giving large numbers of colourable imitations of the University degrees. He wished it to be clearly understood that he does not desire to crush private enterprise, but anybody giving medical diplomas must be open to inspection by a properly constituted Council, and no three or four men had the right to grant licences to practise medicine. He would like to see a combination of Indian Medical men to found one strong institution, properly equipped and recognised by the University, who would send up students for the University degrees.

The motion was carried unanimously.

Correspondence

A DISCLAIMER

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—Will you very kindly spare me space in your columns to say how much I deplore the publication in the *press* of an absurdly sensational, and, in some ways, inaccurate account of an operation performed by me on the victim of a bomb outrage. It is hardly necessary for me to add that I have no knowledge of the writer, nor of the circumstances under which it came to be published, and did not see the account until some days after its publication. As the article seems to have been copied into other papers, I trust that you will very kindly publish this disclaimer.

Yours, etc,

CECIL R. STEVENS,

MAJOR, I.M.S.

CALCUTTA, }
27th June }

"EPIDEMIC PNEUMONIA ON N.W. FRONTIER"

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—Having read the interesting article on Typhus Fever by Captain G. Husband I.M.S., and Captain R. C. MacWatters, I.M.S., in the June issue of the *Indian Medical Gazette* and your own remarks on the subject, I venture to send the following notes which comprise my opinion on the subject of Epidemic Pneumonia. I am afraid I cannot agree with Captain Husband and Captain MacWatters as to their remarks about the 4th and 7th Rajputs.

At the outset, I may state that in my opinion the pneumonia, which occasionally takes on an epidemic form in Malakand, is the ordinary croupous pneumonia met with in England.

During the year 1907, 14 cases of pneumonia occurred in Malakand in the 7th Rajputs with 14 deaths, i.e., with a mortality of 31%.

A study of this is best approached by studying the incidence in Malakand for the past three years in the different regiments stationed there.

1905 1st 11 months	1906 1st 10½ months	1907 whole year
4th Rajputs	66th Punjabis	7th Rajputs
31 cases 12 deaths	7 cases No death	44 cases 14 deaths

The 57th Rifles F.F. were in Malakand during 1904. As I am unaware of the actual number of pneumonia cases which occurred in that regiment while up in Malakand, I have not included them in the above table. It may be remarked, however, that they did not suffer badly.

Thus, it will be noticed that the 57th Rifles were practically immune in 1904 and the 66th Punjabis in 1906, while the 4th Rajputs suffered badly in 1905 and the 7th Rajputs in 1907. To see whether racial difference had anything to do with this immunity of the 66th Punjabis, I wrote to their medical officer to enquire if the Rajput companies in his regiment yielded the largest number of pneumonia cases. The answer was that they were among the least affected, the Punjabis Mohammedans yielding the largest number. So a racial peculiarity seemed to have its say in this pneumonia incidence.

Now, the 7th Rajputs were in China during the last campaign there, and I think I am right when I say that while there they showed the clearest bill of health of all the native regiments in China. Certainly, the intense Chinese winter did not claim its toll of pneumonia from the 7th Rajputs. Why this freedom in a down country regiment? I remember once talking to an officer in the 7th before several of the native officers about this immunity from pneumonia in China in contrast with the terrible incidence in Malakand, when a Jemadar most appositely remarked, "Well, Sahib, we had not been living in Chikdara for a year before going to China."

No! the Jemadar hit the nail on the head that time. Residence in Chikdara, that was the cure of the whole matter.

Both the 4th Rajputs and 7th Rajputs went to Malakand from Chikdara at which latter station they both suffered most severely from malarial fever, while the 57th Rifles and 66th Punjabis went to Malakand from other stations where they had not suffered severely.

In fact, during the year the 7th Rajputs were in Chikdara so severely did the moveable column suffer from fever with one month's residence in Chikdara that I believe, more than 100 men were retained sick to Nowshera in one week. At any rate, so bad was it that now the moveable column no longer remains at Chikdara during the Chitral raids.

And, in my opinion, it was owing to this intense malarial infection contracted in Chikdara that so many of the men of the 4th Rajputs and 7th Rajputs succumbed to pneumonia in Malakand and not because they were down country regiments. In fact, is it not pneumonia that one dies when sending sick British soldiers home in winter. I have heard that many such cases occur in the wards of Netley hospital. I was with the 7th Rajputs in Lucknow and would never have recognised the men as I knew them then with their well filled out bronze coloured faces as the men I knew in Malakand hollow cheeked, hollow eyed, with that gray ashen hue which they then had. Small wonder it was that when these men in that state came to Malakand they suffered from pneumonia. As to why Malakand should tend to produce pneumonia is the next point to be considered. The men reside in stone barracks at various elevations. Malakand itself is situated on the top of a pass and the cold winds simply howl past the houses as they blow from the north on to the plains. This wind in the cold weather regularly starts at about 6 P.M. and continues until about mid day when there is a lull. The barracks are fireless (in Malakand there is the anomalous position of men receiving ration of firewood for warming purposes with no fireplaces in which to burn the wood), and to describe them as draughty is to put it mildly. I cannot agree with Capt. Husband and Capt. MacWatters when they say the Malakand barracks are all ventilated. In my opinion there is too much ventilation. It is difficult to keep the draught out. Even with all the loopholes bunged up the draught finds its way in. I can vouch for this as I have visited the barracks at all hours of the night, to see if I could elicit any information as to the pneumonia incidence, and even in a thick coat have shivered. Certainly, the Malakand barracks are not like the stuffy rooms a native heart seems to delight in. The "Pneumonia barrack" is, it is true, the least draughty, but the name is somewhat of a misnomer when the 7th Rajputs were there, as it was the least affected barrack.

But not to diverge from the point, I found that the men to keep warm in the barracks at night wore all their warm clothes and covered themselves up with their blankets. And in the early morning to answer the calls of nature, they went out into the cold, piercing wind with no additional clothing on and without any food inside them. Small wonder it was that they contracted pneumonia. To my mind it is strange that the toll was not larger. It is just the same as if a Sahib went out of his house in the early morning into a howling gale with the temperature below freezing point straight from his bed in his pyjamas and without a cup of tea inside him. If an English man, who by the way comes from a cold climate, did this, he would be dubbed mad, and he certainly would be mad if he did it in Malakand. Those who have lived there will be able to endorse my remarks.

The sepoy, when this was found out, were then instructed to try to warm their barracks in the evening by live embers in grates, and to sleep without their gaddia coats on. In the early morning on going out to relieve nature they were instructed to put on their coats and wrap themselves in their blankets. At the same time several men received an early ration of tea while others received a ration of rum which latter was described to the men as a medicine. In the morning while the men were on parade all loopholes were opened and as much light as possible allowed to enter the always dark barracks. These efforts were immediately followed by a lull in the incidence and to my mind were most convincing as to the way in which the men contracted pneumonia. Several men contracted pneumonia after playing hockey.

As regards the mortality, 31% among picked men seems large. Still, it must be remembered that these picked men were men markedly debilitated by the ravages of malarial fever.

Osler states that the mortality ranges from 20-40% and that the disease is more fatal in the negro, 31 per cent. is without doubt a large mortality. Still, what can be expected of men who cannot possibly be nursed properly, who when they want to expectorate are as it were herded to the side of the bed and after the sputum is dumped as roughly back again, who have to ask for every thing they want, and who are not made comfortable. Put these men into a clean hospital between clean sheets with nice clean English nurses to look after them, sponge them, give them drinks without being asked, attend to their every want, smooth their pillows, and make them as comfortable as only a nurse knows how to, and the tale would be different.

Again, the difficulty of treating the men in real fresh air in Malakand must have had its say in the death roll. The hospital was dark and draughty, smoke from the fireplaces was constantly filling the wards in gushes. Treatment outside was quite out of the question owing to the continuous hurricane in Malakand. Several medical officers have pointed out to me how well men seem to do in tents.

Epidemic character—This character evidently has raised the doubt as to whether the pneumonia on the frontier is really epidemic pneumonia. In Malakand several cases occurred where sick attendants were attacked. Again, cases were met with where one man in a barrack got pneumonia and then a man in an adjacent bed and then several men in the same barrack.

This led to the suggestion by one not on the spot that perhaps it was typhus and not pneumonia which was prevailing in Malakand. I could not agree with this suggestion nor with any other suggesting any difference from ordinary epidemic pneumonia. In my opinion the pneumococcus is the "causa causans" and that only. Epidemics of pneumonia are not unknown in the western hemisphere.

Endemics and epidemics appear

Osler records that ten occupants of one house were affected once. I also read—"In a prison with a population of 735 there occurred in one year 118 cases of pneumonia with 25 deaths." Direct contagion has also been noted.

To me the proneness of sick attendants is easily explained. The relation of one incident, of which I was a witness, will suffice. A sepoy was ill with pneumonia, he wanted to cough, so his sick attendant pushed him over to the side. The man coughed. The pneumonic sputum with its characteristic tenacious sticky tendency refused to leave the mouth but hung therefrom in an icicle like fashion. The sick attendant caught this up on his finger, shook his finger over the gambrah, then wiped his finger on his clothes and before I had time to stop him, he stroked his moustache with that same finger. He within a week was down with pneumonia. That incident carries its own moral. Countless pneumococci must be let loose each time a man coughs. Even in a hospital this sputum does not always reach the gambrah. What happens in a barrack before the patient comes to hospital can only be conjectured. And note that the sun with its sterilising influence is conspicuous by its absence in a Malakand barrack, as also in the Malakand hospital.

Points noticed in the epidemic

Out of the 44 cases 5 had had the disease before. There was one case of traumatic pneumonia. The patient the evening before was playing hockey when the ball hit him hard in the chest, when next morning there were suggestive signs of pneumonia which next day were typical.

Two cases were in my eyes cases of malarial pneumonia. These were reported in the *Indian Medical Gazette*, April 1907.

Four cases were complicated with Empyema, three being operated on and recovering. The fourth was discovered *post mortem*. Three cases developed Pericarditis. One of these also developed Peritonitis. Large numbers of the cases showed at one time or other abdominal distension, but this was of no moment, speedily disappearing on treatment and was due probably to toxic paralysis of the intestinal walls.

Eight of the cases were of the migratory form of pneumonia. The majority of the fatal cases developed bron-

chitis of the rest of the lungs, which, I feel it, was but an expression of the physiological failure of the lungs.

The three cases who were complicated with Pericarditis had their left lungs affected. But I do not think that it can be argued from this that the pericardium became affected by a process of local extension. It has been definitely established by living that in pneumonia in man the pneumococcus can be grown from the blood in practically every case. In view of this I should say the pericardium became infected from the blood stream, such cases being true cases of pneumococcal septicaemia.

One thing I could never understand was why, in my cases, considering the difficulty one has in keeping the mouths of the men clean from the tenacious clinging rusty sputum which adheres to the men's lips and teeth and dries there, the accessory sinuses never became infected. One would surely have expected cases of otitis media or empyema in the antrum or other of the accessory sinuses in that region.

As regards physique—I have found that the men with the best physique have been the men to succumb, whereas men one would not expect to recover have been the men to recover.

Two of the strongest men in the regiment, both wrestlers, with a splendid physique, succumbed, while the regimental Chondhia, a most miserable specimen of humanity, a man whose forearm I could encircle with my thumb and index finger, whose puny chest was obvious from its very thinness, recovered. I managed to obtain records of height, weight, chest neck, forearm, biceps thigh and calves of the majority of these men and although I found that deaths occurred among some of the best physiques, it was impossible to tabulate the results in any way which would be worthy of note on record.

As it is, I am afraid I have trespasses already too far on your valuable space and will conclude by thanking the medical officers of the 4th Regtants and 66th Punjabs for the information they so kindly gave me.

I am, Sir,

Yours faithfully,

J HAY BURGESS, M.B., F.R.C.S.,

SECMUDFRABAD

CAPT, I.M.S.

[The question of the nature of this Frontier Pneumonia is one of great importance and is worthy of special investigation, we shall welcome a further discussion of the subject.—Ed., I.M.G.]

Service Notes

THE BIRTHDAY HONOURS

THE Medical departments and profession have been fairly prominent in the Birthday Honours List—

Lieutenant-Colonel F. F. Perry, I.M.S., after many years of good service in Lahore, gets a C.I.E., well deserved. Lieutenant Colonel Sherrei, D.S.O., for years Secretary to the P.M.O., H.M. Forces, India, who reorganised the Field Medical Equipment, gets a C.B.

Mrs. Goodbody, wife of Capt C. M. Goodbody, I.M.S., we are glad to see, gets the Kaiser's Hind Silver Medal, also Miss K. Kelavkar, the Medical officer of the Albert Edward Hospital of Kolhapur, Dr. A. C. Lankester of the Church Mission, Peshawar, and Moonshi Nabi Bakhsh, a retired C.H.A. of Damoh, C.P. We are glad to see that excellent Surgeon Dr. Munna Lal, of Etawah, gets the title of Rai Bahadur, the title of Khan Sahib is given to senior Hospital Assistant Syaid Muli ud din Sahib, and to Sher Bai, of Munsiria, N.W.F.P., and Muhammad Hayat Khan. The title of Rai Sahib has been conferred on Pandit Atar Singh, a senior Assistant Surgeon, well known in the Punjab, on Assistant Surgeon Kali Mohan Sen, of Dibrugarh, on Pandit Shri Ditta, senior Hospital Assistant of Kotli State, on Lala Behari Lal, Chief Medical Officer, Poonch.

A CORRESPONDENT referring to our remarks on the new I.M.S. warrant (June, *Indian Medical Gazette*, p. 233) writes strongly on the subject of the extensions of service, and the question of the selected lists of Lieutenant Colonels.

No doubt, the permission granted to men to extend their service after age of 55 so as to be able to put in 30 years for full pension is equitable and in many cases satisfactory, but it cannot be denied that it must necessarily block promotion, and we agree with our correspondent in advocating pensions between the £500 pension at 25 years and the £700 pension at full 30 years. We personally think that an extra pension of £40 for each complete year of service, from 25 to 30 years, would be very fair and very popular and would leave but few to avail themselves of the privilege of being able, if approved, to serve on (after age of 55) for the full 30 years pension.

The pension £700 at 28 years service would bring our service more into line with the ages of men who get this pension in the Indian Army.

Next, as to the selected list. The number of appointments are but few, but are much sought after because they bring three tangible advantages, viz., increased present pay and (for men who entered before 1889) eligibility for one of the four extra £100 a year pensions granted in lieu of certain administrative appointments abolished. (See Lt Colonel D G Crawford's valuable sketch of I M S, *Indian Medical Gazette*, May 1907, p 193), and the eligibility for extension of service for full 30 years pension.

Our correspondent comments on the difficulty of getting into this selected list. Rightly so, it is a selected list therefore any man may be passed over, but there is much to be said in favour of our correspondent's view that men who have been granted extensions to complete the 30 years pension should be removed from this list or preferably should be superannuated in it (as we see no reason for depriving them of the extra pay attached). Also as they are ineligible for promotion, there is little use in keeping them on a 'selected for promotion' list. In some instances men have for years been on the selected list who have drawn a fixed pay and do not get the advantage of the higher rate of pay.

Many of the difficulties would be removed by a graduated system of pensions between 25 and 30 years, and when we consider the large number of men who have entered the service late, after holding hospital appointments (*which now would count as service*) we think the provision of pensions to the amount of £40 for each year over 25 years service in addition to the £500 would be very acceptable to many and would remove many present difficulties.

At the third annual dinner of the Indian Medical Service in Edinburgh, which took place on the evening of May 29th at the Caledonian United Service Club, Shandwick Place, the following officers were present — Surgeon General Sir A Christison, Bart. (in the chair), Surgeon Generals Pinkerton, K H P Bidie, CSI, K H P Turnbull, K H S, G W R Hay, and D Sinclair, CSI, Colonel Warburton, CSI, Brigade Surgeons I Arnold and K Downie, Lieutenant-Colonels MacLaren and Lamont, Majors Marshall Duke, Bidie and Robertson Milne, Captains W F Harvey, A N Fleming, G E Stewart and T McC Young, and 'Assistant Surgeon' W W Ireland. There were also present as private guests W Porteous, Esq, LGS (retired) Dr Allan Jameson, Professors Cunningham and Chiene, Captain Warburton RA, and W Mooney Esq, of the Indian Police. An apology for absence through illness was received from Deputy Surgeon General William Watson.

The dinner was an unqualified success. After the usual loyal toasts had been honoured Sir Alexander Christison proposed the Indian Medical Service and its continued prosperity in a speech of great generosity. Various other toasts followed including the 'Scottish Universities,' suitably responded to by Professor Cunningham, and the 'Royal Colleges' by Dr Allan Jameson and by Professor Chiene, the latter of whom remarking on how much he had been struck by the loyalty of the Indian Medical Service. Everyone present, however, was thrilled when, in response to the chairman's invitation the pathetic figure of Dr Ireland arose, and that distinguished member of the service gave his reminiscences of his all too brief career in India, which ended over half a century ago.

This dinner originated three years ago in the house of Sir A Christison. Surgeon General Spencer, Colonels Warburton and Arnold decided, on account of their inability to attend the London function, they should inaugurate one for those of their brother officers resident north of the Tweed, who were placed in similar circumstances. It was then agreed to hold an annual dinner on the 1st Friday in May.

BRIGADE SURGEON GFORGE SACKVILLE SUTHERLAND, Bengal Medical Service, retired, died in London on 19th May 1908. Born in the West Indies on 1st December, 1833, Dr Sutherland was educated at Edinburgh University. He took the diploma of L R C S Edinburgh in 1855, and entered the Army Medical Department the same year. He served with the Turkish Contingent in Turkey and afterwards in the Crimea from April, 1855, to the close of the war, receiving the Turkish medal and the fifth class of the Medjidie. Resigning after the war he returned to Edinburgh, and took the degree of M D with honours in 1857, receiving a gold medal for his thesis on malarial fever. Entering the Indian Medical Service as Assistant-Surgeon on 4th August 1857 he was just in time for the Mutiny. He served with the Field Hospital of the Army in Oudh at the capture of Lucknow, and in medical charge of the first troop, first Brigade Horse Artillery during the subsequent operations in Oudh in 1858-59, with moveable columns under Sir Hope Grant and Brigadier Eveleigh for which he received the mutiny medal and clasp for Lucknow. He became Surgeon on 4th August 1860, Surgeon Major on 1st July 1873, and Brigade Surgeon

on 7th December 1884, retiring with an extra composition pension on 28th June 1888. Most of his service was spent in Rajputana, where he was for many years administrative medical officer, but for a few years before his retirement he held the appointment of Examiner of Medical Accounts in Calcutta.

The number of Indian Medical Service men who served in both the Crimea and the mutiny was never very large. Since Dr Sutherland's death the only one left is Surgeon Major James Ross, late of Madras.

LIEUTENANT COLONEL T GRAINGER, M D, I M S, has gone to Kohat to act as P M O of the Kohat Brigade, *vice* Colonel Beatson, C B, on leave. Colonel Grainger is one of the most junior men ever promoted to a P M O appointment, he having only 23 years service, while the last I M S man to be promoted to act was Colonel Crofts, C I E, with 31 years service. As most of us know, Colonel Grainger received his promotion from a Junior Major to Lieutenant Colonel for his good work in the Tirah Expedition of 1897, which gave him almost eight years seniority. Since then he has been a Civil Surgeon, chiefly in Bihar, where he is well known as a skilful Surgeon and a keen sportsman and polo player. Colonel Grainger is not yet 47 years of age.

CAPTAIN W RAIT, I M S, has been transferred from Purnea to be Civil Surgeon of Mozafferpur, *vice* Colonel Grainger, I M S.

The following Majors were promoted Lieutenant Colonels, I M S, from 31st March 1908 — James Reid Roberts, M B, F R C S, James Graham Hoyle, M B, Frederick William Gee, M B, Kanta Prasad, M B, Patrick Wilkins O'Gorman, William Henry Gray, Henry Charles Leffler Anim, George Sloane Thomson, M B, and Frank Charles Pereira, M B.

The services of Major C M Mathew, I M S, recently in civil employ Burma, were replaced at the disposal of the Government of India from 15th June 1908.

MAJOR B K CHATTERTON F R C S I, and Captain E Owen Thurston F R C S, have passed the colloquial test in Bengali, and Honorary Captain M E Mungravin has passed in Hindustani.

FIRST CLASS Military Assistant Surgeon W D Neal is posted to Purnea as Civil Surgeon.

CAPTAIN CLAYTON LANE, I M S, Civil Surgeon of Monghyr, was granted six weeks' privilege leave from 3rd June 1908.

MAJOR C H BENSLEY I M S, Superintendent of the Lahore Central Jail, has obtained privilege leave of absence for two months under article 260 of the Civil Service Regulations, with effect from the forenoon of the 8th June 1908.

CAPTAIN W T FINLAYSON I M S, Superintendent of the Lahore District and Pomale Jails, is appointed to officiate as Superintendent of the Central Jail, Lahore, in addition to his own duties, with effect from the forenoon of the 8th of June 1908, *vice* Major C H Bensley I M S, proceeding on leave.

MAJOR A W R COCHRANE, I M S, Superintendent, Lunatic Asylum, Agra, to hold charge of the current duties of the office of Superintendent Central Prison, Agra, in addition to his own duties *vice* Captain I M Macrae I M S, granted leave.

CAPTAIN I M MACRAE, I M S, Officiating Superintendent, Central Prison, Agra, is granted privilege leave for one month, from the 15th June 1908, on subsequent date.

MAJOR H B MELVILLE, I M S, Civil Surgeon, on being relieved, is transferred from Lucknow to Fyzabad.

CAPTAIN W S WILMORE, I M S, Civil Surgeon, U P, was on study leave from 1st October 1907 to 21st March, 1908.

CAPTAIN E A ROBERTS, I M S, was appointed Civil Surgeon of Manipal in addition to his military duties from 25th May, 1908.

The following rule is dated 2251 P, Simla, 21th April 1908 —

'ARTICLE 224 of the Civil Service Regulations requires officers on long leave in Europe to obtain, before the termination of their leave, permission from the India Office to return to duty in India. His Majesty's Secretary of State for India has now sanctioned the abolition of this rule so far as it relates to leave other than leave taken on medical grounds,

but officers will be required to inform the authority who granted them the leave of the date of their return to India, and Article 224 will be amended accordingly.

In consequence of this change the Departments and authorities concerned will no longer be informed by the weekly lists sent from the India Office of the intention of officers to return to duty without applying for extension of leave.

That is, officers on ordinary furlough in England shall not be required to apply for formal permission to return to duty. In all cases officers should, however, in due time write out to the Head of their Department, informing them of the date on which they expect to be back in India.

LIEUTENANT H C BUCKLEY, I.M.S., M.B., is promoted to be Captain, with effect from 1st February 1908.

LIEUTENANT COLONEL C R M GREEN, M.D., I.M.S. (Bengal), is confirmed in the appointment of Professor of Midwifery, Medical College and Obstetric Physician and Surgeon, Eden Hospital, Calcutta, with effect from the 10th April 1908, *vice* the late Lieutenant Colonel F S Peck, I.M.S.

The services of Major G Y C Hunter, I.M.S., are placed permanently at the disposal of the Chief Commissioner of the Central Provinces for employment in the Jail Department, with effect from the 3rd April 1908. This is due to a vacancy in Bengal by the retirement of Mr Payne (Centralisation again).

COLONEL HUME HENDERSON, I.M.S., has gone on five months' combined leave.

His Excellency the Governor of Bombay in Council is pleased to make the following appointment—

Major W S P Ricketts, M.B., I.M.S., to revert to duty as Deputy Sanitary Commissioner, Sind Registration District, and in addition thereto to act as Civil Surgeon, Karachi, during the absence of Lieutenant Colonel R J Baker, M.D., I.M.S., or pending further orders.

MAJOR C T HUDSON, I.M.S., is granted privilege leave of absence for three months, with effect from the 2nd July 1908.

LIEUTENANT COLONEL HARRIS, F.R.C.P., M.D., I.M.S., has gone to the Punjab to act as Inspector General of Civil Hospitals, *vice* Colonel T E L Bate, C.I.E., on leave. Lieutenant Colonel Drury, I.M.S., acts in the Medical College, *vice* Colonel Harris.

His Excellency the Governor of Bombay in Council is pleased to appoint Captain J L Marjoribanks, M.D., F.R.C.P., I.M.S., to act as Civil Surgeon, Nankai, in addition to his own duties during the absence on privilege leave of Major C T Hudson, I.M.S., or pending further orders.

MAJOR C R BAKHALE, I.M.S., has been granted privilege leave of absence for one month from the 13th May 1908.

His Excellency the Governor of Bombay in Council has been pleased to appoint Military Assistant Surgeon J H Whittenbury to act as Civil Surgeon, Bijapur, *vice* Major C R Bakhaile, I.M.S., pending further orders.

His Excellency the Governor of Bombay in Council is pleased to appoint Captain G McPherson, M.A., M.B., C.M., I.M.S., to act as Civil Surgeon, Karwar, *vice* Assistant Surgeon W E Kirkpatrick, pending further orders.

LIEUTENANT COLONEL E HUDSON, F.I.C.S., I.M.S., Superintendent Central Jail, Naini, Allahabad, has been granted three months' privilege leave from 2nd July, and Captain N S Wells, I.M.S., officiates for him.

CAPTAIN H H BROOME, M.B. (Edin.), I.M.S., is appointed Professor of Anatomy, Lahore Medical College. Captain Broome took the M.B., B.Ch. (Edin.), in 1898, and M.R.C.S. and L.R.C.P., in 1903. He won the Martin Memorial Medal at Netley, and was formerly senior Demonstrator of Anatomy at Owen's College, and is a member of the Anatomical Society.

CAPTAIN C B MCCONAGHY, I.M.S. (Bombay), an Agency Surgeon of the 2nd class, is granted privilege leave for one month and sixteen days, combined with special leave for four months and fourteen days, and study leave for six months, with effect from the 31st March 1908, under Articles 233 and 316 of the Civil Service Regulations, and the Regulations prescribed under the Notification by the Government of India in the Department of Military Supply, No 16, Medical Department, dated the 15th March 1907.

CAPTAIN J MCPHERSON, I.M.S., is appointed to officiate as an Agency Surgeon of the 2nd class, and is posted as

Residency Surgeon and *ex officio* Assistant to the Political Resident in Turkish Arabia, with effect from the 31st March 1908.

CAPTAIN N E H SCOTT, I.M.S., an officiating Agency Surgeon of the 2nd class and Agency Surgeon, Maskat, is appointed to hold charge of the current duties of the office of the Political Agent at Maskat in addition to his own duties, with effect from the 1st April 1908, and until further orders.

CAPTAIN C L SOUTHERN, I.M.S., District Plague Medical Officer, Punjab, obtained one month's privilege leave in June.

CORONEL W A QUAYLE's tenure of appointment as P.M.O., *vice* Surgeon General Benson, will date from 1st April 1908.

LIEUTENANT P S MILLS, I.M.S., is appointed a specialist in Ophthalmology for the 2nd (Rawal Pindi) Division.

CAPTAIN S R GODKIN, I.M.S., has passed the examination for Fellowship of the Royal College of Surgeons, Ireland.

The services of Captain W C H Forster, M.B., I.M.S., are placed temporarily at the disposal of the Government of Bengal for a Malaria inquiry.

The services of Captain M R C MacWatters, M.B., I.M.S., are placed temporarily at the disposal of the Chief Commissioner, Central Provinces, for employment in the Jail Department.

The services of Captain W G Richards, M.I., I.M.S. (Madras), are placed permanently at the disposal of the Department of Military Supply.

MAJOR B D BASU, I.M.S., is permitted to retire from the service from 1st May 1908.

The services of Captain H A Dooghan, I.M.S., recently Medical Officer, Loh Shilman Railway, are replaced at the disposal of the military authorities.

LIEUTENANT COLONEL C E SUNDER, I.M.S., went on 18 months' leave from June 16th, 1908, and Captain E Owen Thurston, I.M.S., was appointed to act as Civil Surgeon of Gya.

LIEUTENANT COLONEL R PEMBERTON, I.M.S., District Medical Officer, Vizagapatnam, retired on 1st July 1908. He took the diploma of M.R.C.S. in 1877 and entered the service in March 1878. He was put on the selected list for promotion in October 1904, and now retires on completion of 30 years' service. He was a well known Civil Surgeon in S. India.

The services of Lieutenant Colonel R James, I.M.S., were replaced at the disposal of His Excellency the Commander in Chief from 21st April 1908. He is next for promotion on the Madras side.

LIEUTENANT COLONEL W B BROWNING, M.B., C.I.E., has gone on 13½ months' combined and medical leave, and Lieutenant Colonel F J Crawford, I.M.S., acts as Principal, Medical College, Madras.

LIEUTENANT COLONEL L L VAN GEYZEL, I.M.S., is on leave up to 12th November 1909, and Lieutenant Colonel H Thomson, M.D., I.M.S., the Sanitary Commissioner, up to 24th July 1909.

MAJOR W MOLESWORTH, I.M.S., was due out from furlough on 19th June.

The services of Major J L Maerle, I.M.S., were replaced at the disposal of the Home Department, Government of India, on 13th May 1908.

CAPTAIN H St J FRASER, I.M.S., is due out from his one year's furlough on 24th September next.

CAPTAIN W C LONG, I.M.S., who got 13 months' leave on medical certificate, is due out on 16th August 1908.

CAPTAIN R D WILLCOCKS, I.M.S., is acting as Surgeon to the General Hospital, Madras.

CAPTAIN W R J SCROGGIE, I.M.S., is acting Resident Medical Officer, Madras General Hospital, and Professor of Hygiene and Bacteriology.

CAPTAIN D S A O'KEEFE has been transferred from Tinnevely to South Arcot

CAPTAIN J J ROBB has been transferred from charge of the Central Jail at Bellary to be Superintendent, Central Jail, Rajamundry

MAJOR BHOJA NATH, I M S, and Captain R W Knox, I M S, have passed the first half for the F R C S, England. Out of 114 candidates only 38 per cent passed and 62 per cent were rejected

THE services of the undermentioned officers are replaced at the disposal of His Excellency the Commander in Chief in India — (Government of India, dated June 6th, 1908)

Captain J O'Leary, M B, I M S
 Captain H M H Melhuish, I M S
 Captain W F Bryne, M L, I M S
 Captain M S Irani, I M S
 Lieutenant H C Buckley, M B, I M S
 Lieutenant C E Palmer, M B, I M S
 Lieutenant W D Wright, M B, I M S
 Lieutenant N S Sodhi, I M S
 Lieutenant H P Cook, M B, I M S

MR E H HANLIN, Chemical Examiner, U P, has granted three months' privilege leave from 20th June 1908. Captain E J O'Meara, I M S, officiates as Chemical Examiner, etc

MAJOR S H BURNETT, M B, C M, I M S, is granted, from the date of relief, such privilege leave of absence as may be due to him on that date in combination with special leave for such period as may bring the combined period of absence up to six months

LIEUTENANT COLONEL A W DAWSON, I M S, is appointed to hold civil medical charge of Roorkee in addition to his military duties, *vice* Lieutenant Colonel S O Philson, R A M C

COLONEL O E PENNIFETHER LLOYD, V C, A M S, is appointed an Honorary Surgeon on the personal staff of H E the Viceroy, *vice* Colonel J F Williamson C B, C M G, retired

COLONEL J G HARWOOD, A M S, P M O Presidency Brigade, has been transferred, temporarily to Lucknow Division, and Lieutenant Colonel W W Pike, D S O, R A M C, acts as P M O, Presidency Brigade, in addition to his other duties

ON the promotion of Colonel P H Benson, I M S, to be Surgeon General, Madras, Lieutenant Colonel W A Quayle, I M S, is promoted I M S Colonel, dated from 1st April 1908

CAPTAIN T S ROSS, I M S, is due out from 16 months' combined leave on 11th August 1908

CAPTAIN H ROSS, I M S, Assistant Plague Medical Officer, Jullundur, is appointed District Plague Medical Officer, Jullundur, with effect from the afternoon of the 10th of May 1908, *vice* Major H Smith, I M S, proceeding on leave

SENIOR Assistant-Surgeon Kedai Nath Bhandari, in charge of the Civil Hospital, Jullundur, is appointed to officiate as Civil Surgeon of Jullundur, with effect from the afternoon of the 10th of May 1908, *vice* Major H Smith, I M S, proceeding on leave

LIEUTENANT W D WRIGHT, M B, I M S, is appointed to the civil medical charge of Buxa Duars, in addition to his regimental duties

MAJOR J T CALVERT, I M S, the Civil Surgeon of Dargae ling, is appointed a Civil Surgeon, first class

THE amended rules for the encouragement of the study of Oriental language for junior Civilian and Military Medical Officers in civil employ were published in a Government of India Resolution, dated Calcutta, 20th December 1907

HIS Excellency the Governor of Bombay in Council is pleased to appoint Major J B Jameson, M B, I M S, on return to duty, to act as Civil Surgeon, Ahmednagar, during the absence of Lieutenant Colonel W A Colker, I M S, on pending further orders

LIEUTENANT COLONEL R J BAKER, M D, I M S, has been appointed to act as Deputy Sanitary Commissioner, Sind Registration District in addition to his own duties, with effect from the 2nd May 1908

LIEUTENANT COLONEL F C REYES, Surgeon First District, Madras, has got six months' leave up to end of October

MAJOR J B JAMESON, I M S, continues to act as Civil Surgeon, Ahmednagar, but is appointed Superintendent of Mahabaleshwar, *vice* Major S H Burnett, I M S, on leave

THERAPEUTIC NOTES AND PREPARATIONS

WE have received samples of a new preparation of CYLLIN, recently placed on the market. It is called *Cyllin Obstetrical Lubricant*. It is guaranteed, says Mr Amsho Walker, the Managing Director of Jeyes Co., Ltd., to contain a sufficient quantity of Cyllin to "render sterile all surfaces with which it may be brought into contact in midwifery or gynaecological practice." It is free from caustic or toxic properties as well as from grease, and is readily soluble in water. It can be recommended as a substitute for vaseline, &c.

KEMP & Co., Ltd. Bombay are agents for the preparations of the SANATOGEN CO. The value of these preparations is well known, and attention has recently been directed to the use of Sanatogen in cases of Malarial Cachexia, and the cachexia of chronic dysentery. Indeed in all malarial conditions it is found to be of use. It is easily assimilated. It is a preparation strongly to be recommended in all cachectic conditions and especially in those following on chronic bowel trouble.

ERNUTIN the new active principle of Ergot, is worth the attention of physicians. Messrs Bimroughs Wellecome & Co. put it up in two forms for oral use, and for intramuscular injections.

YFAST is an old remedy for boils. It can be now obtained in an elegant form under the name CEREDIN from Messrs Hadenfeldt & Co., of Pollock Street Calcutta.

RECENT work in the etiology of hemoglobinuria has shown that it is probable that the *Sulphate of Quinine* is not the best form of Quinine to use in such cases. Howard and Sons, the well known Quinine Manufacturers have put on the market QUININE BIHYDROCHLOR both in powder and in tablets, and this is worthy of the attention of physicians.

THE catalogue of the HOLBORN SURGICAL INSTRUMENT CO., is one well worthy of the attention of Civil Surgeons. Address, 26, Thavies Inn, Holborn Circus, London, E C.

Notice

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs Thacker, Spink & Co., Calcutta.

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Annual Subscriptions to "*The Indian Medical Gazette*," Rs 12, including postage, in India Rs 14, including postage, abroad.

BOOKS, REPORTS, &c., RECEIVED —

E B & Assam Jail Admin Report
 U P Jail Administration Report
 Secunderabad Civil Hospital Report
 Madras Maternity Report
 Green & Co's Encyclopedia of Medicine Vol 8
 Brooks's Atlas to Tropical Medicine 2nd Ed., Baillière Tindall & Cox
 Jessop's Ophthalmic Surgery (2nd Edition) Churchill
 Lloyd's Hay Fever and Asthma (H J Gladsher)

LETTERS, COMMUNICATIONS, &c., RECEIVED FROM —

Lt Col Lukis F R C S, I M S, Calcutta Capt Hay Burgess, I M S, Malak and Capt Gidney, I M S, Dindigul Major Stevens, F R C S, I M S, Calcutta Major Browning Smith, I M S, Simla Capt Leitch Mackie, I M S, Bombay Lt Col Brown, I M S, Simla Dr Kate Vaughan, Missouri Major Raitt, I A, Rawal Pindi Lt Col Jennings, I M S, Bombay, Major L Rogers, I M S, Calcutta

Original Articles.

JAIL DYSENTERY, WITH SPECIAL REFERENCE TO FORSTER'S VACCINE

By W. GILLITT, M.B.,

CAPTAIN, I.M.S.,

Superintendent, Central Jail, Burma

In the issue of the *Indian Medical Gazette* for January 1908, I gave the results of my experience in 106 cases of dysentery of the value of Forster's vaccine treatment. In the present paper I propose giving the results of my experience of this treatment in 120 cases of dysentery treated in the Buxar Central Jail. Before proceeding to deal with these cases it will be well to recapitulate certain points.

The Midnapur Jail had for years been notorious as a dysenteric jail. Moreover, the dysentery in this jail was of a very bad type, the case mortality was very high (63 per cent) as compared with the case mortality of the disease in the other jails of Bengal (28 per cent). From the result of his investigations in this jail Forster made the following propositions—

1. The dysentery in the jail was mostly bacillary in nature.

2. The commonest and most important cases were those due to Shiga's bacillus. According to Forster, these cases were of the type which tended to terminate fatally or to become chronic.

3. The clinical type of the disease induced by Shiga's bacillus differed considerably from that described in Japan and elsewhere. The disease was practically never of the fulminating type, and death rarely occurred before the third week of the disease. This difference in clinical type was attributed by Forster to acquired racial immunity.

4. The spread of the disease in the jail was due to patients being discharged from hospital before they were completely cured. According to Forster, dysentery patients are only infectious so long as they have unhealed lesions, and true bacilli carriers, if they exist, are of rare occurrence.

5. In Shiga infections drug treatment is of little avail in averting either death or chronicity.

As the natural outcome of these propositions Forster suggested the routine treatment of all cases of dysentery, acute or chronic, with a vaccine prepared from Shiga's bacillus. The reasons given for this line of treatment were briefly as follows.

Shiga cases—As death in these cases rarely occurred before the third week there is ample time for vaccine treatment to be effective. By means of a properly graded dosage the much-talked-of negative phase and its dread results could be practically eliminated. The examination of the opsonic index of patients in whom

the disease became chronic, indicated that auto-inoculation had not taken place to any great extent. By vaccine treatment the absence of auto-inoculation could be provided for, and the patient ought to make a complete recovery without having any chronic unhealed lesions.

Other bacillary cases—In these cases a Shiga vaccine, if it does no good, can do no harm. By inoculating them with Shiga vaccine these cases are provided with an active immunity against that bacillus, so that when they are turned into the post-dysenteric gang or the general file, they are protected against subsequent infection with that bacillus.

In these cases, therefore, the vaccine treatment is mostly prophylactic.

Amœbic cases—The toxin of Shiga's bacillus is directly antagonistic to amœbæ. This toxin has a selective site of excretion, *viz*, the large intestine, and therefore can be used with great advantage in the treatment of these cases.

Forster contended that if his propositions were well founded, then systematic vaccine treatment of all cases of dysentery, commencing on the day of admission, should give the following results—

1. A reduction in the case mortality, as the direct result of this method of treating Shiga Dysentery.

2. A general fall in the incidence rate of the disease, owing to cases being really cured before being discharged from hospital.

3. The virtual abolition of chronic dysentery from the jail.

The first jail in which this method of dealing with dysentery was used was the Midnapur Jail, and in the January issue of the *Indian Medical Gazette* for 1908, I gave the results of my experience of the value of this method in 106 consecutive cases.

Briefly in that paper I came to the conclusion that these cases proved the soundness of Forster's views. The case mortality under this treatment fell to 0.9 per cent, as compared with a case mortality of 5.9 per cent in a control series of unvaccinated cases. The case mortality from dysentery in the jail fell from 8.4 per cent in the previous year to 2.1 per cent in 1907.

Re-admissions from the post-dysenteric gang ceased, and chronic dysentery was banished from the jail. There was a general fall in the incidence rate of the disease in the jail as shown below—

1906	319 per mille.
1907	173 " "
1908	135 " "

The systematic vaccine treatment was carried on in the Midnapur Jail up to the time when I left it on 2nd July 1908, after which it was discontinued. The Midnapur Jail has now been under observation in connection with dysentery investigations for two years, *viz*, 1907

and 1908 For these two years the figures with regard to the case mortality, in vaccinated and unvaccinated cases, are as follows —

Vaccinated cases —141 cases with 2 deaths—a case mortality of 1.4 per cent

Unvaccinated cases —128 cases with 7 deaths—a case mortality of 5.5 per cent

These figures speak for themselves

The history of the Buxar Central Jail with regard to dysentery will be seen from the accompanying charts

Chart A, which is compiled from the yearly incidence rate per mille for the last 20 years, shows that the jail has never been free from dysentery, that the disease has gradually been getting a firmer hold, until in 1906 and 1908 the incidence was as high as 281 and 279 per mille respectively

Chart B shows two curves The continuous line curve shows the average monthly incidence of the disease (ratio per mille) for the nine years 1900—1908 The dotted line curve shows the monthly incidence of the disease during 1908 and up to 31st of May 1909 Taking first the curve for the nine years, it will be seen that the incidence at the beginning of the year is low, that it rises gradually except for a slight fall in June, until it reaches its maximum in August After this it gradually falls until the end of the year

There was a distinct difference in 1908, as shown by the dotted line curve Instead of the gradual fall after August, continuing until December, this fall was arrested in October, both November and December showing a very high incidence rate, and it is therefore evident that there was an unusual epidemic of dysentery at the end of 1908

I was unfortunately not able to obtain any vaccine when I first took over charge on 2nd November last, but was able to commence the routine treatment on 18th December All cases of prisoners admitted to hospital passing mucus after this date were treated with vaccine

The routine was as follows —

Immediately on admission a dose of 0.2 cc of vaccine was given in the subcutaneous tissue of the flank or arm No drugs were used, except in cases showing signs of heart failure, when stimulants were administered

Fourteen days after the first injection a second dose 0.3 cc was given, and after another 14 days a third dose 0.4 cc

In ordinary cases treatment was stopped at this point, but in severe cases and in men who had had repeated attacks previously, a fourth and occasionally a fifth dose were given of 0.5 cc and 0.6 cc respectively

On 16th February 1909, 100 consecutive cases had been treated It was then thought that it would be interesting and instructive to treat

alternate cases with vaccine and drugs, to get a comparison of two sets of men under absolutely similar conditions, but under different methods of treatment

Unfortunately for this experiment, but fortunately for the jail, the number of cases rapidly decreased, until after 20 cases had been treated by each method the supply entirely ceased No cases occurred from 5th to 31st May

The value of the treatment of dysentery by Forster's vaccine will be clearly shown by an outline of the results obtained —

1 *Case mortality* —The average case mortality in this jail for the last 20 years was 3.8 per cent, the maximum being 16.9 per cent, and the minimum 0.4 per cent In 1908 there were 344 cases with 18 deaths, a case mortality of 5.2 per cent

Of the present series of 120 cases treated with vaccine none of them died, and all have been discharged from hospital, a case mortality of nil None of the 20 cases treated without vaccine since 16th February 1909 have died

Including my Midnapur cases, I have now treated 261 cases of dysentery with vaccine Out of these cases two died, giving a case mortality for vaccine treatment of 0.76 per cent

2 *Number of days in Hospital* —In order to obtain an idea of the value of vaccine treatment, as compared with drug treatment, from the point of view of the number of days in hospital, a comparison was instituted between a series of vaccinated and unvaccinated cases The conditions with regard to the two series were identical, with the exception that one series was treated by vaccine only and the other by drugs only In both cases the patients were discharged from hospital after they had passed healthy stools for 14 days The result is shown in the following tabular statement —

Series	Total number of cases	Total number of days in Hospital	Average number of days in Hospital
Vaccinated	65	1351	20.5
Unvaccinated	65	1769	27.2

On an average, therefore, the vaccinated cases were seven days less in hospital than the unvaccinated cases Vaccine treatment eliminates chronic cases, which tend to bring up the average, but apart from this there is a distinct margin in favour of the vaccine treatment even in ordinary cases

3 *Gain in weight after discharge to the P D Gang* —The rapidity with which patients gain weight during the month they remain in the P D gang after discharge from hospital is a very good index of the completeness of the

JAIL DYSENTERY, WITH SPECIAL REFERENCE TO FORSTER'S VACCINE

By CAPTAIN W GILLITT, M.B., D.S.,
Superintendent, Central Jail, Buxar

CHART A

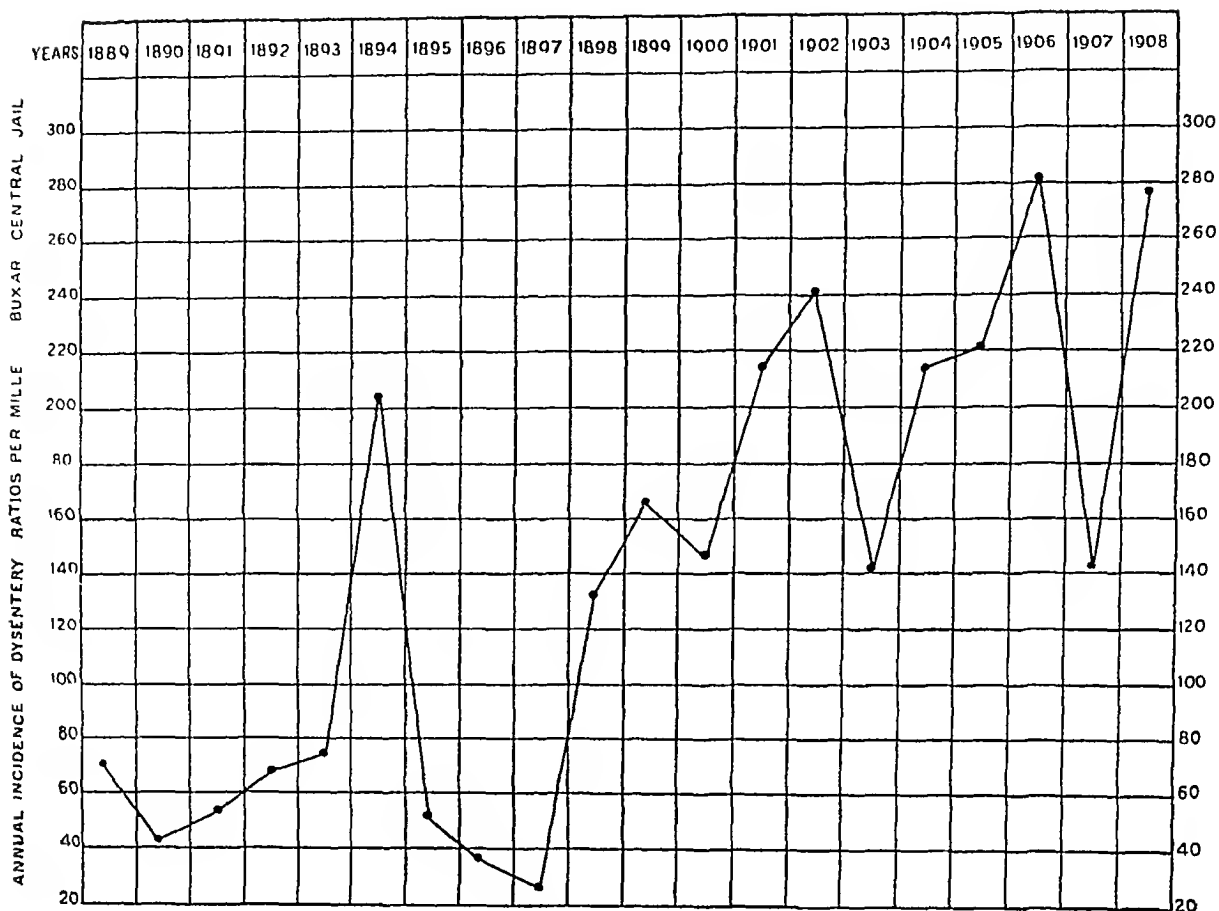
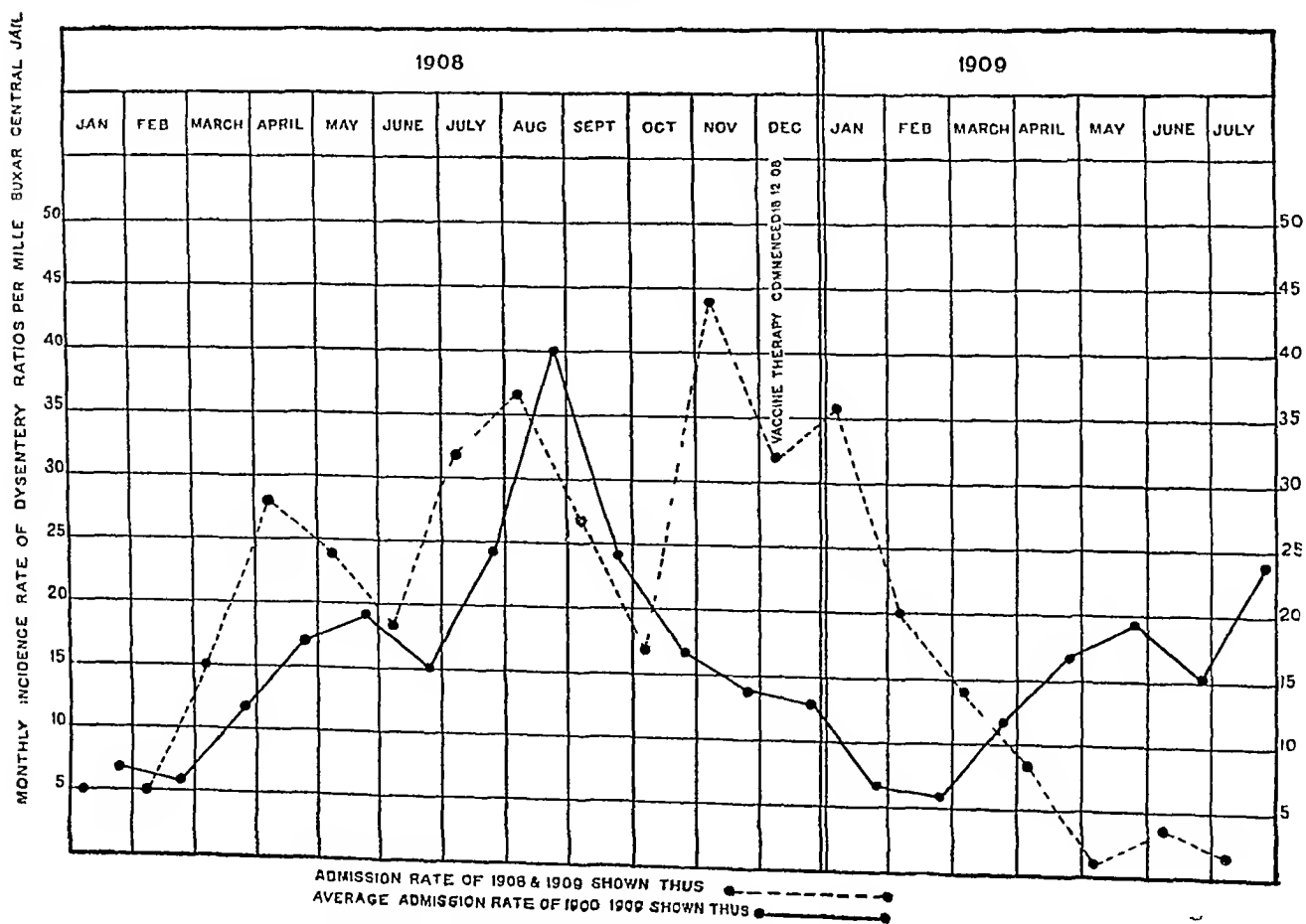


CHART B.



recovery The result with regard to the two series of cases noted above was as follows —

Series	Total number of cases	Total number lbs gained	Average gain in lbs
Vaccinated	65	415	6 ½
Unvaccinated	65	181	2 ½

It will be noticed that the vaccinated cases gain weight with much greater rapidity than the unvaccinated cases

4 *Relapses and Recurrences after discharge from Hospital*—Apart from case mortality, this is the test by which all methods of treating dysentery should be judged. In this respect there is no comparison between drugs and the vaccine. Of the 120 cases treated with vaccine not one case has had a relapse or a recurrence, whereas before vaccine treatment was begun practically every case relapsed. During November and December 1908, most of the cases of dysentery admitted to hospital were admitted direct from the post-dysentery gang, or after a recent attack of dysentery. These readmitted cases furnished nearly all the fatal cases which occurred during those months.

It will be remembered that after the 16th February last, every alternate case was treated by drugs only. One case out of this drug treated series has already relapsed.

5 *Lowered incidence*—The rapid fall in the incidence of the disease is strikingly shown in Chart B. It is seen that after the use of the vaccine—which was begun on 18th December 1908—the incidence rate rapidly fell from 36.4 per mille in January until in May it was practically nil, i.e., 1.5 per mille.*

Nature of the epidemic—Unfortunately, owing to the large number of cases and the pressure of other work, I was unable to examine the mucus of the earlier cases microscopically. 39 of the later cases were examined, and amoebæ were found 3 times, i.e., in 7.7 per cent of the cases. Flagellate bodies occurred in 7 cases out of the 39. There was a polynuclear leucocytic exudate in 25 cases, i.e., in 64 per cent.

This exudate is said by Captain Forster to occur chiefly in bacillary cases. The frequency with which this was found, combined with the clinical features of the cases, e.g., the frequency with which the disease started with fever, and the rarity with which amoebæ were found, justify one in assuming that the epidemic was mainly bacillary in nature. These observations, so far as they go, tend to support Forster's views that Jail dysentery is mainly bacillary.

* The fall in the incidence rate is still being maintained the figures for June and July being 3.7 per mille and 2.2 per mille respectively.

Local and General effects of the Vaccine—The vaccine, as before stated, is injected into the subcutaneous tissue of the flank or arm. Locally there is a reaction which varies considerably, in some cases being almost unnoticeable, and in extreme cases causing marked swelling and tenderness lasting for some days. The latter is rare. Forster and I have conjointly given over 1,000 inoculations and in no case has an abscess or any bad effect occurred, even in men in the worst state of health whose resistance to pyogenic organisms was presumably reduced to a minimum. The only general effect is a slight rise of temperature. The patient rarely complained of fever after the dose, but by taking the temperature six or seven hours afterwards, it was found that fever occurred in 78 per cent of the cases, irrespective of whether it was the first or a subsequent dose. It was in all cases slight, ranging from 99° to 100° and only lasted for a few hours.

Very soon after the vaccine treatment was introduced into the jail, its value was recognised by the prisoners and by the Staff, and men admitted to hospital before the treatment was begun, and who were not improving, frequently asked to be inoculated. This was done and was successful in every case.

Among the members of the Staff vaccinated were the Jailor, a Hospital Assistant, an Assistant Jailor, an Assistant Accountant, and three Warders. All of these men asked for the vaccine as soon as the attack commenced. Several prisoners who have recently had repeated attacks of dysentery have been vaccinated as a prophylactic measure, but it is too early to draw any conclusions from these cases.

General Treatment—The first and most important factor in ensuring the success of any line of treatment in this disease is rest. It is desirable that this should be continued until all griping pains have ceased and until the stool is free from mucus. Even after this, exercise should be very slight and no work except the very lightest should be attempted for at least a month after the attack.

In all the Jails of Bengal, in accordance with a Circular issued by the Inspector-General of Prisons, all prisoners are kept in hospital for 14 days after their stools are free from mucus, and then are put in the post-dysenteric gang for at least a month. While in the gang they do nothing at first, but after a time they are employed on such work as weeding, cutting grass, etc., in their own compound, where there is no chance of their mixing with other prisoners. All tools used by them are kept separate and are used for no other purpose.

No drugs are used where the vaccine is given, except stimulants when there is any sign of affection of the heart muscle, such as weak pulse with swelling of the feet. These symptoms occur much less frequently where rest is insisted on, and consequently one cannot lay too great stress

on the importance of rest as part of the treatment

Diet.—In the acute stages this should be milk, diluted or not, according to the patient's power of digestion. As soon as the acute symptoms have disappeared, he may gradually but rapidly get on to more solid food such as Dahi, sago arrowroot, rice, plantains, eggs, boiled fish, etc. In a very few days full diet may be given, eliminating only vegetables and fruits with fibres and seed. It is a mistake to starve patients too long after the acute symptoms have subsided, one's object should be to build up the strength as quickly as possible, being guided in the main by observing the effect of a given diet. The danger of bringing the patient to too low a condition is probably greater than that of a single error in diet.

Under vaccine treatment, when once the acute stage has passed and the mucus ceases to be tinged with blood, there is little danger of a relapse caused by ordinary convalescent diet.

Segregation—This is most important in preventing the spread of the disease, and without intelligent co-operation on the part of the Hospital Staff and the Jailor it cannot be efficiently carried out.

To make segregation really effective, the greatest care must be taken in the minutest details.

It is a universal practice to segregate dysentery cases while they are suffering from the disease, but everything goes to show that the longer this segregation is enforced after discharge from hospital, the less likelihood there is of the dissemination of the disease.

Men are kept in the post-dysenteric gang for a month at least after discharge from hospital, and during this time they should be kept strictly apart from other prisoners. They should not be allowed to do even light work in contact with others. If they work at all, it should certainly not be in a factory, where it is impossible to prevent them mixing with other prisoners and where the material they are working on passes through several hands immediately after wards.

Even after discharge from the gang they should have nothing to do with the food of other prisoners and should not be employed in the cook-house.

The following incidents which occurred in this Jail emphasise the importance of segregation.

In the middle of January last, there were 45 cases of dysentery in hospital and 32 men in the post-dysenteric gang. There were also 47 cases of other diseases and 62 prisoners in the various gangs, a total of 186 men in the hospital compound. This caused the hospital staff to be so busy, that the carrying out of segregation was left almost entirely to warders and convict officers. The result was that the post-dysenteric gang were allowed to mix to a certain extent with other men in the hospital, and quite

a number of cases of dysentery occurred in men being treated in hospital for other diseases.

As soon as this was realised, the convalescent dysentery cases and the post-dysenteric gang were moved out of the hospital compound in the daytime, and only those dysentery cases were left who were confined to bed. The dysentery convalescents used a separate latrine and bathing platform, had their food separately and were only allowed in the dysentery wards in the evening to sleep, and while proceeding to the hospital were strictly guarded.

As a result of these measures no more cases of dysentery were admitted from the hospital compound.

It is advisable to give the post-dysenteric gang a distinctive badge so that they may be detected at once if they wander from their own gang. In this Jail, and also in Midnapur, ordinary prison clothing is worn with a large D in red cloth sewn on the front of the cap.

As regards the prisoners' food, orders were given early in November that no prisoner who had suffered from dysentery during his imprisonment should be employed in the cook-house.

This worked well for a time, but in the middle of January 1909 there was quite an epidemic among the cooks themselves. On enquiry I found that by mistake three men who had had dysentery a few months before were working there, none of these men had been treated with vaccine. When these men were removed the cook-house epidemic soon died out.

In the Buxar Central Jail it is impossible to keep men apart from other prisoners after discharge from the post-dysenteric gang, but in a Jail built on the plan of the Midnapur Central Jail, it would be quite feasible to keep all men who had ever had dysentery in one compound.

They could in this way work, eat, bathe and sleep quite apart from other prisoners, and I am sure the results would more than repay for all the trouble taken to carry this out.

It is too soon at present to be certain on the point, but I think that cases treated with a full course (at least three doses) of vaccine are quite incapable of spreading the disease.

If it is proved that vaccine causes destruction of all the dysentery bacilli *in situ*, and that consequently no cases recur or become carriers, then an elaborate system of segregation will be unnecessary, and our views will have to be modified accordingly.

Diagnosis—This is sometimes very difficult, and as it is necessary that the treatment should be commenced as early as possible, the best plan is to treat all cases with mucus in the stool as dysentery, until some other diagnosis is arrived at.

Typhoid fever in its early stages may simulate dysentery, and if, as very occasionally happens, the disease is febrile the differentiation is extremely difficult. But it is better to treat a case of typhoid fever with the vaccine than to

miss a real acute case of dysentery, and put off the treatment until it may be too late

The giving of dysentery vaccine in typhoid fever is quite without danger. When I had typhoid fever last year the attack commenced with dysentery-like symptoms and I at once had 0.2 cc dysentery vaccine. This had no prejudicial effect on the disease.

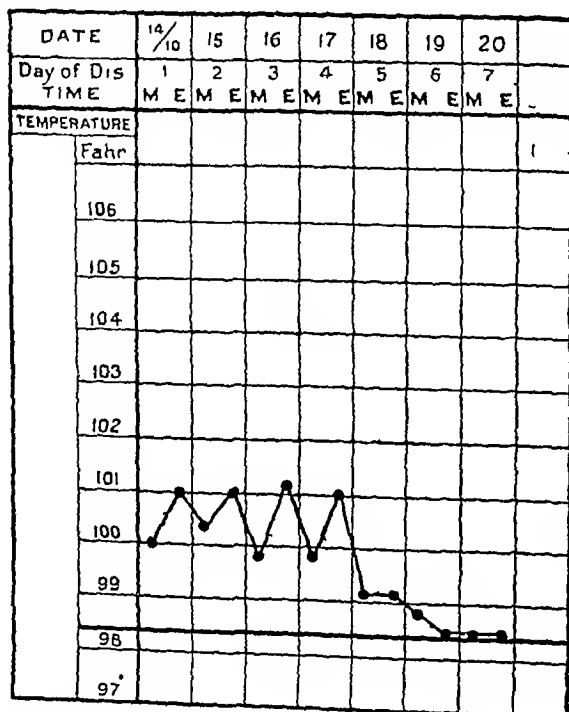
A case of afebrile typhoid with all the symptoms of acute dysentery occurred in this Jail at the beginning of December 1908 and was only diagnosed *post mortem*. This was before vaccine was used in the Jail, otherwise he would have been inoculated.

Another type of case which is very difficult to diagnose is a chronic diarrhoea in the later stages of chronic dysentery. If the case is seen throughout, there could be no difficulty, as there would certainly be mucus in the stool at one stage or other of the disease. Failing this, a reliable history or a bacteriological examination of the stools is necessary, and when neither of these can be obtained, one can only guess at its true nature.

A case of this kind occurred in this Jail last year. A prisoner aged 60 was admitted to hospital on 6th October for diarrhoea and died on 2nd January 1909. His symptoms during the time I saw him were simply those of diarrhoea and inability to digest food.

Post-mortem—He was found to have most extensive ulceration of the whole of the colon and rectum. In future I should certainly give vaccine in such a case. If the diarrhoea were of dysenteric origin, it would probably yield to this treatment, whereas if it were not, no harm would have been done.

CHART OF A CASE OF DYSENTERY ACCOMPANIED BY FEVER



Several cases have occurred in which the most prominent symptom at first was fever.

These were the acute bacillary cases due to Shiga's bacillus. A typical temperature chart of one of these cases is shown. These men all complained of fever and made no mention of their bowel symptoms. It was not until their stools had been seen that a correct diagnosis was arrived at.

Complications—There were very few complications in this series of vaccinated cases. In one case rheumatism occurred affecting both knees, but cleared up in a few days under local treatment.

In a few cases, those who did not come to hospital until late, there were signs of failure of the heart with oedema of the feet. These soon recovered with absolute rest in bed combined with stimulants. Before vaccine was given, I saw several very marked cases of this complication, one man having general oedema and ascites.

Tenderness over the liver, usually a very common symptom, and due to congestion or slight hepatitis, was very seldom present in vaccinated cases, as also was the inability to digest food which frequently makes the convalescence of dysentery so slow.

Mode of spread—Probably the usual methods of spread are (1) direct contact, such as when prisoners walk in pairs holding hands, (2) the handling of tools or utensils recently touched by a man suffering from or who has had dysentery, and (3) the infection of food after cooking by a man who harbours the bacilli or by flies. It is worthy of note that when the epidemic was at its height in this Jail, flies were unusually abundant, and that the dysentery decreased as the flies became less numerous. Whether there was any connection between the two occurrences I cannot say. Probably the part taken by flies in the spread of the disease depends on the care taken in keeping latrines scrupulously clean, and in immediately removing and burning dysenteric stools. If stools are required to be kept for inspection, they should be placed in a box with a lid, as is generally done in Jails, or kept in flat tins with well fitting covers.

Prophylaxis—The most effective method of preventing the spread of dysentery is probably the treatment of all cases with vaccine. If this leads to destruction of the dysentery bacilli in the intestinal ulcers, then the patient is rendered entirely innocuous and incapable of becoming a bacilli carrier.

All the results obtained in Midnapur as well as in this Jail support the above view.

Before I left the Midnapur Jail in July 1908, only one case had recurred out of the those treated with the vaccine during the previous twelve months, and that was an amoebic case. I have not been able to follow up the cases since then, with the exception of two men who are in this Jail now and who have not had a recurrence.

In this Jail, as before mentioned, none of the vaccinated cases have had a relapse or recurrence.

In Jails, where the population is essentially a shifting one, there must always be cases of dysentery among the newly-admitted prisoners, owing to infection before admission. I feel sure that even these could be eliminated by the routine inoculation of all newly-admitted prisoners.

A very important factor in the prevention of dysentery is the early recognition of the disease. For some reason or other many prisoners do not come to hospital for several days after the first symptoms, and it is a very difficult matter to detect these cases.

An excellent rule in Jails is that all prisoners wishing to attend the latrine during working hours must go to the hospital compound, where their stools are seen by the Hospital Assistant on duty, and if the stool is not healthy, the man is detained. In this Jail there used to be a latrine in the factory, which men attended. This was afterwards closed, and the men made to go to hospital if they wanted to attend the latrine in working hours. During the first few days several cases of dysentery and diarrhoea were detected at the hospital latrine, some of them of several days' duration. It is obvious, that during this time many other prisoners may have been infected.

Another safeguard is that all men visiting the night latrine should be seen in the morning by the Hospital Assistant, and all men suffering from illness detained.

A useful practice, when dysentery is prevalent, is for the Hospital Assistants to attend latrine parades, and personally inspect the stools of each batch of prisoners before disinfection is used. By taking the latrines in turn, the whole Jail may be gone through in a few days, and it is surprising how many cases are thus detected early.

All prisoners employed in the cook-house should wash their hands with soap and water, using a nail brush, in the presence of a responsible officer, before commencing work. They should also be provided with carbolic lotion to rinse the hands in before drying.

Conclusions—The above cases of dysentery in this Jail amply confirm my previous experience of the value of vaccine treatment as a routine measure.

I think that —

- (1) It reduces the case mortality
- (2) It gives a better recovery with a shorter stay in hospital than any other form of treatment
- (3) It abolishes chronic dysentery from the Jail and in almost every case prevents recurrence
- (4) It reduces the incidence rate of the disease in a striking manner

I am indebted to Civil Hospital Assistant Syed Nasiruddin Ahmad for much assistance in looking up the records of these cases.

Records of a few cases treated with vaccine

1 *Prisoner Dudd Nath Singh, aged 45*—Came to hospital on 20th December 1908 from the post-dysenteric gang. His history was that he had had dysentery in September 1908 and again in November 1908.

His condition was very grave and he was at once admitted to hospital and inoculated. He was passing daily 3 or 4 watery stools containing mucus, his feet and legs were swollen, his abdomen was distended and his pulse was weak. On 25th December he was passing healthy stools, but was still extremely weak. His convalescence from this time was slow but uninterrupted.

2nd injection of vaccine	11 09
3rd " "	16-1 09
4th " "	31 1 09

Under treatment his weight increased from 112 lbs to 117 lbs.

2 *Gurbhoo Ahn, age 40*—Previous history—Had dysentery in July 1906, September 1906, May 1907, August 1907, September 1907, October 1907, December 1907, May 1908, August 1908, September 1908, October 1908. He was admitted again to hospital on 21st December 1908, and at that time was passing about 4 loose stools daily, mixed with mucus. Marked oedema of feet, hands and face. Some fluid in peritoneal cavity.

Inoculated on 21st December and given stimulants. The stools showed no marked change until 31st December, when he passed a perfectly healthy stool, and this was the case also on the following 2 days. On 3rd and 4th January he passed formed stools with slight mucus, but after this the stools remained healthy.

Recovery was uneventful, and the oedema gradually disappeared. Four inoculations were given in all. Gained 12lbs while in hospital, a further 13lbs while in the post-dysenteric gang, and 8lbs since discharge from the gang until the present time.

3 *Sikla Dome, age about 30*—Was admitted to hospital on 23rd December 1908 with acute dysentery. Had high fever, and passed numerous stools, as many as 40 and 50 daily, consisting entirely of mucus and blood mixed with slough, no faecal matter.

Inoculated on 23rd December 1908. Stools became less frequent from 26th December, and by the 30th he was only passing 3 or 4 stools daily, consisting of faecal matter mixed with slight blood and mucus. Stool was quite healthy on 14th January 1909, and he was discharged to the gang on the 29th January 1909. His normal weight was 140lbs, but at the end of the acute stage it fell to 90lbs. On discharge from the post-dysenteric gang his weight was 150lbs.

4 *Prisoner Harihar Pattak, age 36*—Previous history—Had dysentery in December 1905, August 1906, May 1907, June 1907, October 1907, August 1908, September 1908, and October 1908

Present attack—Admitted to hospital on 5th November 1908. No treatment was of any benefit. On 23rd December he passed 15 stools containing mucus and was apparently in a hopeless condition. Inoculated on this date.

3rd January 1909—4 stools well formed with mucus.

13th January 1909—Stool healthy.

Further inoculations on 6th January, 20th January and 4th February.

Gained 34lbs in weight while under treatment.

5 *Durbich Ahir, age about 26*—He had had repeated attacks of dysentery. Was admitted to hospital on 27th October 1908 and treated with drugs. At the end of December his condition was serious, he was passing frequent watery stools containing greenish mucus and some blood. His feet and legs were oedematous, pulse almost imperceptible. Inoculated on 31st December. His stool was quite healthy on 7th January 1909, and remained so until his release from Jail on 20th January. All oedema had at that time disappeared.

Second inoculation given on 14th January.

6 *Nanhoo Dusadh, age 32*—Previous history—Dysentery in July 1908, September 1908, October 1908.

Admitted to hospital on 5th November 1908, treated with drugs with no improvement until 6th February last. On this date he was inoculated, and again on the 20th February and 6th March. Discharged cured to P. D. gang on 10th March 1909.

7 *Sheo Ratan Dusadh, age 40*—He was admitted to hospital on 16th February. He first complained of fever and was treated for this, but the next day complained of severe pain in the abdomen. On 18th he passed 8 watery stools containing mucus and blood.

Inoculated on 19th February

20th February 1909—Passed 30 stools with mucus and blood, no faecal matter.

21st February 1909—Passed 36 stools with mucus and blood.

22nd February 1909—Passed 21 loose stools with mucus, no blood. These were faecal.

23rd February 1909—Passed 10 stools semi-solid, with slight mucus.

24th February 1909—Passed 2 stools, formed, with mucus in coils.

28th February 1909—Stool healthy.

Inoculated again on 5th March and 19th March. Discharged from hospital on 14th March 1909.

Gained 10lbs in hospital and 7lbs in the P. D. gang.

8 *Udit Thakur, age 52*—Previous history—Dysentery in September 1907, January 1908, May 1908, September 1908.

Came to hospital on 24th February 1909, complaining that he had not passed a formed stool for years. His stool was found to be loose, containing mucus, no blood.

Inoculated on 24th February 1909

1st March 1909—Stool well formed, with mucus.

5th March 1909—Stool healthy.

Further inoculations on 10th March, 24th March and 10th April.

Discharged to P. D. gang on 18th April 1909.

Gained 16lbs while under treatment in hospital and a further 4lbs while in the gang.

CLINICAL NOTES ON SMALL POX *

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In the present paper I do not propose to do more than to discuss briefly certain clinical points of importance in relation to the subject of small-pox.

The first matter to which I would invite attention is the infectivity of the disease. When does small-pox cease to be infectious, what makes it infectious, when does it begin to be infectious?

As to the first of these, it is generally accepted that a patient is not to be regarded as free from infection till, as MacCombie says, "all the crusts and desiccated pustules have fallen off, and the subsequent desquamation on and around the newly-formed epidermis is complete." In this connection, however, I have repeatedly been able to point out that careful observation will in most cases be able to detect a fine branny desquamation not only "on and around the newly-formed epidermis," but also the otherwise unaffected skin areas separating the sites of the healed pustules from one another. I have seen this so marked on the shins in a case in which there were only comparatively few pustules on the legs, that friction of the skin gave it an appearance as if it had been lightly dusted with bran, but in the majority of cases it is readily enough observed in lesser degrees of distinctness. I have always regarded this desquamation with something more than suspicion and never consider a patient as free from infection till his skin is absolutely free of all suspicion of scuffing.

Next, what is it that makes small-pox infections? All that we can say on this point is that although there can scarcely be any doubt that the contagion of variola is a living micro-organism, its nature has not yet been finally

* Being a paper read before the Medical Section of the Asiatic Society of Bengal, July, 1909.

determined. It may be that the essential contagion consists in the sporadic pansporoblasts of the *Cytoryctes Variolæ* of Guarnieri, penetrating into epithelial cells, escaping into the blood stream, or cast off in the contents of the ruptured pock. It may be that Ewing and other critics are right in declaring that the protoplasmic appearances noted in connection with Guarnieri's organism are to be more correctly interpreted as particular forms of cell degeneration. It may be that in the *Amœba Variolæ* of W. E. De Korte, an organism described as abundant in fresh variolous matter, and as persisting in it for many months, we have the true virus of small-pox (*Lancet*, Vol 2, p 1776 of 1894), or it may be that having so long escaped detection it is really a virus that is ultramicroscopic. Be all that as it may, the fact remains that it is known beyond dispute, that the virus resides in the pock, that it is abundant in the scabs shed from the pocks, and that it is by the scabs and other cast off epithelial detritus from the dying pocks that the infection is conveyed from man to man. Another point on which all authorities appear agreed is that it is not definitely known by what channel a susceptible person becomes affected. MacCombie, however, states that "the virus enters the body by the mucous membrane of the mouth, nose or respiratory tract, some believe also by the mucous membrane of the stomach." Budwood (*Guy's Hospital Reports*, Vol XLVIII, 1892) believed it to be received through the skin. It has been suggested that a protopustule is developed somewhere in the respiratory tract, and that it is responsible for the general infection of the body. The protopustule has, however, not yet been discovered although carefully sought for. The occurrence of protopapules on the skin is, however, not uncommon, whatever their importance, and it was on their characters that Budwood based his view.

The next question is when does a patient suffering from small-pox begin to be infectious? On this point MacCombie says "Small-pox patients are capable of communicating the infection to others, perhaps during the stage of incubation, certainly during the initial stage, and right through the disease till not a trace is left on the skin of desiccated pustules, or scars or of the subsequent desquamation." Biernacki, in *Bain's Textbook of Medicine*, says "Small-pox is infective in the prodromal stage if not earlier," and Goodall and Washbourne in the 1908 edition of their *Manual of Infectious Diseases*, state that "the patient is most infectious during the vesicular, pustular, and scabbing stages, but he is also infectious during the prodromal and papular stages." Ricketts and Byles, on the other hand, speaking of the early fever of small-pox being at times mistaken for other febrile diseases, say that "such misinterpretations are of little moment in the earliest stage

of the illness, because the disease is seldom infectious before the outcrop of the focal rash." These views are clearly at variance, and the matter at issue is a very important one. The general impression among those practising the Eastern systems of Medicine is that small-pox is not infectious till the vesicular stage, and these last, be it remembered, are people who for generations have lived their lives in a country which is the old endemic home of Small-pox. On this point, seeing that there is thus diversity of opinion I have, with all due respect to the opinions quoted above, attempted to seek for a solution, and I would venture to lay before the section, for whatever it is worth, the conclusion which I think is reached from a study of the small-pox cases admitted to the Campbell Hospital during the last four years. In this matter I have taken the incubation period as averaging 12 days, and have borne in mind that most authorities also have it that this may, in very exceptional cases, be extended to as much as 16 or even 21 days or contracted to as little, as in hæmorrhagic cases, as 7 or 8 or even 5 days.

From January 1905 to the present time our Small-pox wards have been empty for only thirty-one days all told, and during this period of some four and half years, we have had two severe epidemics, and two minor outbreaks. In the course of all this, and during this period, we have had admitted to the general wards for various causes, a total of 89 cases who have subsequently been declared as suffering from small-pox. Some of these have been in the wards only for a day, others from the beginning of their incubation to the time when they shewed signs that left no doubt that they had developed variola. The detail of these is as follows —

First and Second Medical (Male) Wards	32 cases
Female Ward	24 "
"Temporary" Ward	25 "
Plague Ward	11 "
Cholera Ward	4 "
Surgical Ward (male)	3 "
Total	89 cases

Of these, only those can be said to have actually contracted the disease in hospital who had been in the Hospital for 12 clear days before developing any prodromal symptoms of small-pox, except the hæmorrhagic cases to which we might, for the sake of argument, allow an incubation stage of 7 to 8 days.

On these lines, we arrive at the following as having taken the disease in the Hospital —

In the Medical (Male) Wards	1 out of 32 cases
" Female Wards	2 " 24 "
" "Temporary" Ward	4 " 25 "
" Plague Ward	none " 11 "
" Cholera Ward	3 " 4 "
" Surgical Ward	3 " 3 "
Total	13

With regard to the above, the case from the Male Medical Wards developed his first fever on the 26th February and as a hæmorrhagic case, he may have taken his infection from the cases admitted on the 20th or the 14th February or from fomites carried in with these cases. Of the two cases from the Female Wards, the first had only eight days since its first contact with the last case in the ward and the second an interval of 22 days. Both of these were obviously infected from fomites, and cannot be put down to direct infection. The four cases in the Female "Temporary" Ward all occurred in the course of about four weeks. It is not possible to say where she first got her infection from. But as the medical officers in charge of this ward also attend in the Small-pox Ward, it is possible that they may have carried infection to her. Or she may have had infection carried to her by others, such as Hospital servants or visitors. The second was a very old woman (aged about 80), and must have got her infection much as the first case and, as her eruption was advanced to the seventh day before she was transferred, it is more than likely that the next case caught its infection from her. For the fourth case no personal contact is traceable. The four cases in the Cholera Wards undoubtedly owe their infection to the following: (1) they are within a few yards of the Small-pox Hospital gate, (2) conveyances bringing small-pox cases stand close to them while waiting to be disinfected, (3) they are immediately next to the small-pox observation hut. The three cases in the Surgical Wards are all obviously quite distinct from each other and none of them can be said to have infected any other.

With all this, the striking feature is, to my mind, not that we had what we had, but that our wards escaped as they did.

The average daily strength of our individual wards from month to month, during the period under observation, has varied from 27.33 to 121.93, and the average stay of patients in hospital, including the moribund cases who die within a few hours of admission, is about eighteen days—so that we may, excluding these latter, reasonably take this figure at approximately twenty days. The male medical wards, with a strength of from 65 to 117 patients, averaging 20 days in the wards, had 32 cases of small-pox which between them spent 130 infective days in the wards, and of only one case can it be said—and that too is doubtful—that he got his infection from his fellow-patients. Similarly, the Female Ward, with an average varying from 46 to 121, harbours 20 cases over 83 infective days with only one doubtful infection, the Surgical Ward, with an average strength of from 42 to 115, has three cases, all in the middle of epidemic periods, during an aggregate of 47 infective days, counting incubation periods, and including 5 days of eruption and not a single infection. In the Female

"Temporary" Ward the detail has been already given. The Male "Temporary" Ward again gives a daily average of from 54 to 66 patients, a total of 19 small-pox cases, during 37 infective days, and not a single infection. On all this evidence it appears to me that the mere presence in the wards for three or four days, of cases not farther advanced than the fourth or fifth day of eruption, was not followed by an appearance of the disease in the hospital. It would appear farther, that in actual practice, in the earlier stages of the disease, *i.e.*, up to the fourth or fifth day of the eruption, the real danger is not from the patient himself, but from the infection which he may be carrying mechanically, and which is derived not from his own person, but from the same source of infection which is responsible for having given him the disease.

The appended tables shewing the incidence of the disease in the wards of the Campbell Hospital speak for themselves, and shew the full detail on which the foregoing remarks are based. It remains to add that the patients in these wards were not in any special way or degree protected by vaccination. In this respect they were just an average sample of the general population of the town and suburbs of Calcutta.

(To be continued)

A NEW LACTIC ACID PRODUCING STREPTOTHRIX *

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SINCE Metchnikoff in his book "On the prolongation of life" and other similar publications brought to the notice of the scientific world, the beneficial action of lactic acid bacilli, when taken internally, on intestinal flora-fermented milk, prepared with one or other varieties of the bacilli, has come into extensive use as an article of diet, both by patients as well as by healthy men, and the study of fermented milk has received an impetus.

Metchnikoff who had been studying for some time the flora of human intestine, when on a visit to Bulgaria, found that a much larger percentage of people there reach to old age than those of other countries, and the only peculiarity he noticed in their diet was that they are accustomed to taking curdled milk prepared with a special ferment with their daily meal. By bacteriological examination of the curdled milk which goes by the name of *Youghourt*, it was found that the fermentation is brought about mainly by a bacillus, since named *Bacillus Bulgaricus*, and experiments made with a pure culture justified the theory, put forward by Metchnikoff, that the beneficial action of the fermented milk, is due to the healthy action which the bacilli

* Being a paper read before the Medical Section of the Asiatic Society of Bengal, June 1909.

produce on the intestinal flora. These bacilli, which do not produce gas and are not proteolytic, replace the ordinary gas-producing and proteolytic bacilli present in human intestine used to ordinary diet. Experiments made on guinea-pigs by J. Belonosvsky with a culture of this bacillus showed that the stool of animals taking ordinary diet when inoculated into sugar bouillon produces marked formation of gas and cloudiness of the broth, after feeding the guinea-pigs for a few days on this fermented milk containing the *Bacillus Bulgarius*, he found that bouillon inoculated with the stool of these animals showed distinct diminution of gas-formation and cloudiness. On the 21st day of feeding, the inoculated sugar bouillon showed absolutely no gas formation nor any cloudiness nor any smell. Animals fed with this milk from their birth were found to increase in weight much more than those fed with ordinary diet or with sterilised food. The utility of the action of Bulgarian milk can be thus explained.

In several countries the use of fermented milk is known from ancient times, though its rationale was not understood. In several European countries fermented milk is taken in the form of butter-milk—milk is allowed to ferment by keeping it in the open air for a certain time and then the butter is removed by churning. The same process is adopted even now in America and other places where in a slightly improved form "Starters" (pure culture of a bacillus) are used instead of leaving it in the open air.

But it is to the Eastern tropical countries that we must look for the special form of fermented milk, in which the milk is curdled by means of a special ferment which is kept in stock in every household and is handed down from generation to generation, the milk being taken in the shape of curd. These ferments are much more active and give much more solid curd of agreeable aroma than in the case of the fermented milk in use in Europe and America. The extensive use of one or other varieties of fermented milk, produced by means of a special ferment in Eastern countries, probably owes its origin to the difficulty of preserving milk in sweet condition for a long time, in comparison to cold countries, milk when undergoing spontaneous decomposition in hot climates becomes changed within a few hours to a foul-smelling fluid in which the casein and the fat have undergone liquefaction, whereas, when fermented by means of the special ferment, the decomposing, gas-producing, proteolytic bacilli are killed off by the more vigorous organism of the ferment which has no destructive action on the fatty or albuminous constituents of milk, so that by this means milk can be kept in a condition fit for consumption for a long time. In this way the economic problem of preservation of milk is solved. The following are some of the known varieties of curdled milk in use in Eastern countries, some of which have been made the subject of bacteriological study.—

Mazun of America, Kepliyi and Koumiss of Russia, the Leben of Egypt, the Oxygala and Chiston of Rome and Greece and the Rayet of Algeria.

In India, curdled milk made on similar lines to the above is in extensive use, besides there is another variety of curdled milk which is prepared in an entirely different way, its use is entirely confined to Bengal, its prototype cannot be found anywhere else, so far as my knowledge goes. The production of this second kind of curd depends on the action of the products of a bacillus and not on the living bacillus itself. From this curd, a large number of delicacies are prepared by addition of syrup and sugar, etc., and there are very few Bengalee households in which food prepared from this curd is not in daily use, and a large trade is carried on in it.

The variety which is the subject of this paper is also in extensive use, and the best preparations are invariably served at every dinner party.

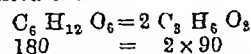
The first variety goes by the name of Dadhi and the second as Khilat. Both have originated in remote antiquity and have been mentioned in old medicinal works like *Bhava Prakash*, in which have been described several varieties with their medicinal virtues. Even in old classical works 2,000 to 3,000 years old, these have been mentioned several times. The following is the orthodox method of preparation of the first variety (Dadhi), in some cases some modification is made. Pure milk is boiled for some time—then cooled to blood heat, and then from an old stock of Dadhi a needle pointful of stuff is taken and with this the milk is inoculated. The milk is covered with a blanket and kept in a warm place. After 12 hours the milk is found to have curdled. This unbroken curd is served as a dish and is taken with a little salt or sugar.

Before describing the Bacteriology of Dadhi I give below a description of different varieties of lactic acid bacilli and their action on milk.

LACTIC ACID BACILLI AND THEIR ACTION ON MILK

A general knowledge of the composition of milk is necessary in forming a clear idea of the action of the bacilli on milk. Without going into details a short general idea of the composition of milk is as follows—

Milk contains besides water some soluble salts of which the most important are the calcium monophosphate and sodium salts. There is also sugar of milk from which is produced the lactic acid—the process being a duplication of the atoms of lactose which is represented thus—



Then there is the fatty constituent of milk which is found in the form of minute globules distributed throughout the milk, the agreeable aroma of some fermented milk is due to a certain amount of change of fat producing an ester, much greater change with saponification of fat accompanies butyric acid fermentation to which the bad odour of decomposing milk is due. Then there are the albuminous constituents of milk. About the characters and nature of these, observers are not

agreed and widely divergent and contradictory opinions are held, both as regards the composition of the constituent parts as well as regards the interpretation of the phenomena of curdling brought about by (1) rennet, (2) lactic acid fermentation, or by (3) ordinary acids.

To find out the truth from this chaos would have been a difficult task, had it not been for the monumental work of Duclaux, who has exhaustively dealt with the phenomenon of coagulation of milk. It is a well known fact that there are marked differences in the characters of the precipitated casein produced by the action of acid, lactic acid fermentation and rennet. But to describe the difference in chemical technology is rather a difficult problem. The hitherto accepted opinion was that casein in chemical combination with the calcium phosphate remains in solution in ordinary neutral milk, when any acid is added to the milk, the compound is decomposed, the calcium salt combines with the acid added owing to which the casein is precipitated. When, however, rennet is added to milk, as the coagulation takes place in the absence of any acid and as also the presence of calcium salt in milk is necessary for the rennet to act (calcium free milk is not coagulated by rennet) one set of observers explain the action of rennet on milk as a splitting up of the original casein into a soluble albumose called lacto-protein, and another albuminous product which combines with the calcium phosphate and falls down as precipitate, thus in the case of coagulation by acid, the casein which was supposed to be in solution in ordinary neutral milk is believed to be precipitated by forming a compound with calcium salt, the calcium salt combining with the acid, in the case of coagulation by rennet, on the other hand, it is supposed that casein goes into combination with the calcium salt to form the precipitate. Both explanations cannot be true at the same time as they are chemically contradictory.

Besides Duclaux has shown that after coagulation of milk by rennet, no increase of soluble albumin takes place, the whey of the milk which is separated by means of a porcelain filter shows on examination the same amount of soluble albumin as the whey separated by the action of rennet. He suggests that the calcium salt is not in chemical combination with casein in ordinary milk, but it helps by its presence in some unknown way the action of rennet on milk much in the same way as calcium salts are necessary for the formation of fibrin in blood by the action of fibrin ferment and the phenomenon of agglutination of bacilli by agglutinin. He further states that unchanged casein as a pure chemical compound, such as was first separated by Hammerstan, is insoluble in water but is soluble in water in presence of calcium monophosphate and other neutral or partially alkaline salts, while acids decompose or precipitate the calcium monophosphate and cause the precipitation of casein. Casein as found in milk is not in a state of solution in the strictly chemical sense of the term, but being a colloid is held in suspension like mud in water and the action of an acid is to cause decomposition of calcium monophosphate which helps to keep it in suspension, while the action of rennet may be compared to the action of fibrin ferment on fibrinogen in blood, the calcium salt being necessary for the coagulation of casein, as is the case with fibrin ferment.

How do the lactic acid bacilli act on casein? Is the coagulation solely due to the chemical action of the lactic acid formed by the splitting of the sugar of milk brought about by the action of the bacilli? It has been proved in many cases of lactic acid fermentation that the amount of lactic acid formed is much too small to give rise to coagulation by its chemical action. Besides, it has been shown that when chalk powder is added to milk previous to inoculation by lactic acid bacilli coagulation of milk takes place, though the lactic acid formed by the action of bacilli combines with the chalk and no free acid is available to act chemically. Then it can be surmised that the action of the lactic acid bacilli on

casein is due to the presence of a ferment which has not been separated as yet, aided by the lactic acid.

Varieties of lactic acid bacilli—As regards the varieties of lactic acid bacilli, already more than 50 have been separated, many of which are not found ordinarily in milk but in connection with other ferments. Many of these produce other products such as alcohol, acetic acid, butyric acid, etc., while the formation of lactic acid is a minor function of the bacilli the quantity produced being very small. Leaving out of consideration these bacilli there is another class of bacilli which may be termed producers of true lactic acid fermentation, in accordance with the definition of Duclaux who assigns the term to those which produce lactic acid to the extent of 50% of the total amount of by-products of the bacilli. Of this class of bacilli the first was discovered by Lord Lister, before this, coagulation of milk was supposed to be a process of oxidation, due to excess of oxygen taken by the cow, though Pasteur suggested the action of some living organism like yeast before Lister's discovery. To Hueppe belongs the credit of actually studying a pure culture of a lactic acid bacillus since named *Bacillus Acid Lactici* (Hueppe) and from this period the study of milk fermentation dates. Escherich (1885) found another lactic acid bacillus in the intestine of infants taking milk, called *Bacillus Lactis Aerogenes*, Grottenfeld separated also a lactic acid bacillus besides a *Micrococcus Acid Lactici*, Gunther and Thierfelder found in spontaneous fermented milk a bacillus which is identical with Lister's *Bacillus Acid Lactici*, Hueppe's bacillus as well as with *Leichmannia Bacterium Lactis* found by Leichmann. The view of the identity of the several bacilli has been confirmed by Woignin. Besides these a number of bacilli have been separated by Kozai, by Klaus and Uiz. From the mass of literature dealing with the subject it is not possible to make out how many of these bacilli are identical with one another and how many are distinct separate bacilli as the characteristic on which differentiation is based does not remain constant in one and the same bacillus. These groups of bacilli can, however, be clearly differentiated from the next class of Lactic Acid Bacilli, viz, the bacilli found in connection with the curdled milk of the East and which form a class among themselves.

These latter are differentiated from the former by the formation of a larger amount of lactic acid, by the entire absence of gas-formation in milk, the entire absence or very little action on the fatty and albuminous constituents of milk (excepting the coagulation of casein) by refusing to grow in the ordinary culture media, this latter characteristic being a most important point. A short account is given below of the bacteriology of the several varieties of special curdled milk, together with the distinctive characters of the specific bacilli found in connection with them. Freudenreich examined bacteriologically the fermented milk which goes by the name of Kephyr and separated two varieties of streptococci, a bacteria called the *Bacillus Can casini* and a yeast, though combined action of all three is required to form the typical Kephyr, yet Freudenreich believes that streptococci are mainly responsible for the fermentation. The *Bacillus Caucasina* cannot alone ferment milk.

The Leben of Egypt has been thoroughly studied by R. Rest and J. Khoury, who found in it—

- (1) A big bacillus with square ends called the streptobacillus *Lebens*.
- (2) A fine bacillus with rounded ends called the *Bacillus Lebens*.
- (3) A Diplococcus called the *Diplococcus Lebens*.
- (4) An oval shaped yeast called the *Saccharomyces Lebens*.
- (5) A long fungus called the *Mycoderma Lebens*.

Of these the most important is the streptobacillus *Lebens*. The bacillus *Lebens*, the *Saccharomyces* or the *Blastomyces Lebens* when separately inoculated into milk does not clot it. The *Diplococcus Lebens*, however, rapidly coagulates milk. The streptobacillus *Lebens*

is a straight rod shaped bacillus, being 6μ to 7μ in length and $\frac{1}{2}\mu$ broad. It is nonmotile and takes all aniline stain. The protoplasm is homogeneous. In old cultures it is granular and takes Gram's stain. In the depths of glucose agar it dies quickly. In ordinary agar, there is absolutely no growth and in potato, peptone broth and ordinary bouillon, there is no sign of growth. In lactose or glucose agar it grows and shows visible colonies. It coagulates milk at 37°C in 24 hours.

It produces 0.261 per cent acid in terms of lactic acid.

The Armenian curdled milk Mazun, has been studied by Duggeli who found—

- (a) A coccus
- (b) A yeast
- (c) A long bacillus
- (d) A thin short bacillus

As the result of detailed study of the properties of all these organisms he has come to the conclusion that the yeast contributes to this palatable taste and aroma of Mazun.

The coccus participates in causing diminution of the unpalatable whey, the short bacillus gives rise to a certain amount of lactic acid, but none of these separately introduced into milk is able to curdle it. The long bacillus being the most active lactic acid producer and is alone able to curdle milk within 24 hours. This bacillus is about 3 to 10μ in length, 1 to 1μ broad, the ends are rounded. In young cultures the protoplasm of the bacilli is homogeneous, but in old cultures they are more or less granular. The bacillus takes Gram's stain and grows badly in glucose agar. No growth in bouillon—no growth in agar, nor peptone water, nor potato. It is a facultative anaerobe. Milk is curdled in 24 hours at 37°C , with slight separation of whey. It produces in milk 1.008 grams of lactic acid in 100 c.c. of milk in 24 hours.

Bulgarian milk has been studied by several observers. Bertrand and Weisweiler studied the action of the bacillus on the several constituents of milk. Belonovsky studied the action of the bacilli on intestinal flora of animals when fed with the bacilli. This has been referred to in the beginning. A. Cohendy and Iverson and Kuhn studied the bacteriology of Bulgarian milk. The later observers found three species of organisms in it—

1. The *Bacillus Bulgaricus*
2. Bacilli granuleaux (Kornelien bacilli)
3. A diplococcus

The *Bacillus Bulgaricus* is rod shaped, nonmotile, extremities rounded, takes Gram, the protoplasm shows no granules. In favourable media it forms transparent colonies about 2 to 3μ in diameter. In liquid media it forms a white precipitate. The bacillus is a facultative anaerobic. The best medium is milk. It coagulates milk very slowly.

2. Bacilli granuleaux are rod shaped bacilli, larger than the above, nonmotile, they take Gram. The protoplasm is granular. They take Neisser's stain. Facultative aerobic and anaerobic. Sugar solutions and milk are the best media. Milk is rapidly coagulated. As regards the action of the *Bacillus Bulgaricus* on the several constituents of milk, it has been studied thoroughly by Bertrand and Weisweiler. They found that the bacillus coagulates milk. The precipitated casein is slightly acted upon by the bacilli, after a month, there was diminution of only 1/10 part of casein. It does not saponify fat. By means of a ferment (lactase) formed by the bacilli, the sugar of milk is split up and forms two molecules of lactic acid without producing any intermediary products, the lactic acid formed is a mixture of dextrorotatory and laevorotatory lactic acid. This amount of lactic acid formed is shown in table I.

Description of the organism found in curdled milk of India which goes by the name of Dadhi—For the purpose of finding out the

specific organism in Dadhi, I procured several samples from the different shops from different localities in Calcutta and also samples from districts outside Calcutta reputed for their excellence in the preparation of Dadhi. Smear preparations were made from each sample on a slide, fixed and then stained with carbol-methylene blue. As all the samples showed a bacillus with definite characters in almost pure culture, mixed with some yeast cells, an attempt was made to separate the bacillus from several samples and study its character. The several bacilli separated from the different samples, were found to show uniform characters—being in fact the same organism. As a pure culture of the bacillus inoculated in milk was found to produce curdled milk similar in character to those got from the market, there is ample justification in assuming the bacillus as the cause of the fermentation.

The character of the Bacilli—As found in the samples bought from the market and stained by methylene blue, there were found innumerable bacilli parallelly arranged with square cut ends about 7μ to 8μ in length, 2μ in breadth. The most peculiar character noticeable about these bacilli is the finding of pink-stained granules situated at equal intervals inside the blue-stained bacilli. Though for staining only pure methylene blue is used, the bacilli are doubly stained. It is, indeed, difficult to make out from which constituent of the methylene blue the pink colour is derived. The bacillus when stained with Leishman stain or thionin blue does not show the granules. Neisser's stain does not stain the granules. That these granules are not spores is apparent from the fact that the bacilli are easily killed at 60°C within a few minutes. The granules are best seen in a 24-hour culture. In old cultures they are not so prominent. An explanation is furnished regarding the nature of the granules from the fact that yeast cells found in connection with these samples of curdled milk also show distinct pink-stained granules inside the cells. Some one suggested in a similar condition in connection with Bulgarian milk that the granules inside the yeast cells are composed of glycogen and the pink staining is due to the glycogen, the same may be the case with the granules found in this bacillus. The number of granules situated in each bacillus vary from 2 to 10. When they are two in number, they occupy the two ends of the bacillus. The bacilli take Gram's stain. They are nonmotile. Another marked peculiarity of the bacillus is that they refuse to grow in all ordinarily used culture media—nutrient agar, bouillon, potato, nutrient gelatine, peptone water, glucose or lactose peptone. In glucose or lactose agar, the bacilli grow, showing within 24 hours at 37°C a fine streptococcus-like colony growth. In depth of glucose agar, a distinct growth takes place along the inoculation tract. After 72 hours the whole

A NEW LACTIC ACID PRODUCING STREPTOTHRIX

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medium becomes clouded. Smear preparation from a solid culture showed bacilli which are of an entirely different character from the bacilli found in milk culture, so much so it seems at first difficult to believe that the two are the same bacillus. The smear from a glucose agar culture stained with methylene blue showed long thick bacilli in which there are no granules. The bacilli are peculiarly convoluted and twisted, some in corkscrew fashion, some convoluted like the edges of a leaf. The bacilli are long big filaments, some measuring more than 40 to 50 μ . In some as many as 20 to 30 turns of the corkscrew can be counted. Besides these, fantastic appearances are seen in a smear preparation. Milk tubes inoculated from the peculiar shaped bacilli found in agar culture, show again the same granule-containing bacilli when stained with methylene blue.

Growth in Milk—The organism grows rapidly in milk, curdling it in 12 hours, forming a solid coagulum, the upper surface of the milk being concave. There is no separation of whey. By violent shaking the clot can be broken and a few drops of clear whey can then be separated. The life of the bacillus in milk, after clotting is completed, is very short. After seven days the bacilli are themselves killed. As in the case of the other bacilli described above, the coagulation is not due to the sole action of the lactic acid, as can be easily determined by inoculating milk tubes containing chalk, the calcium carbonate neutralising the free acid, still coagulation takes place.

The sugar of milk is changed into lactic acid, no subsidiary products are formed. The bacilli do not decompose the whole of the sugar present in milk, even after several days the presence of sugar can be demonstrated. The fatty constituents of milk are not acted upon at all by this bacillus. Even after a month no smell of butyric acid can be perceived. The casein is precipitated, but there is absolutely no other action on the albuminous constituents, as even after a month not a trace of peptone can be found.

Regarding the nature of the organism, it is evident that it belongs to the class of bacilli having granules—the *korichen* bacilli which have been placed in a separate class by Lehmann and Neumann, they are allied to streptothrix. The presence of long convoluted and twisted chains and the presence of granules prove it to be a streptothrix.

As regards the relation of this streptothrix to other similar bacilli found in the previously described curdled milks, viz., *Strepto-bacilli* *Lebenis*, *Long Bacilli* of *Mazun*, the *Bacillus Bulgaris* and the *Bacilli granuleaux*, it is evident that this remarkable organism, though it resembles the above bacilli in several points, namely, the formation of large amount of lactic acid, similar action on milk (no gas formation, no saponifying action, no peptonising action), refusal to grow in ordinary media, yet this

streptothrix has got sufficient peculiar characters to differentiate it from those enumerated (1) the pink-stained granules in bacilli stained with methylene blue, (2) the peculiar character of the bacilli in agar.

The action of the streptothrix on pathogenic organisms—A few experiments were made to determine the action of the bacilli on pathogenic organisms in culture tubes. The following are the results—

For this purpose, several sterilized milk tubes are taken and they are inoculated with a loopful of a culture of the streptothrix in milk and then the tubes were inoculated with a loopful from 24 hours' cultures of Typhoid, Shiga, Coli, Paratyphoid B, Comma, Gartner's bacilli and Diphtheria bacilli. After 24 hours' incubation at 37° C, the tubes were examined by making smears as well as by inoculating in bouillon and agar, and in the case of cholera bacilli, in peptone water. After 48 hours the same procedure was repeated and also after 72 hours. The following are the results—Comma bacilli were killed off within 24 hours, and no trace of the bacilli could be found. The agar tube inoculated with typhoid bacilli shows a growth of separate colonies showing the inhibitory action. After 48 hours, a few separate colonies were found, on the 3rd day the tube remained sterile. Diphtheria bacilli were killed off in one day. Coli, Shiga, Gartner and Paratyphoid B, could be found up to forty-eight hours beyond which they died.

A milk tube was inoculated with Comma bacilli and incubated for 24 hours, Comma bacilli were found to have multiplied in the milk, then the streptothrix was inoculated. After 24 hours interval, no trace of the Comma bacilli could be found. My experiment in this direction as well as on animals and human beings have not been completed as yet.

Resumé—

1 The fermented milk of India called *Dadhi* resembles in all essential points the *Bulgarian* fermented milk as well as the *Leben* and other forms of fermented milk in use in the East.

2 The causative element of the curdling process of *Dadhi* is a streptothrix having characters similar to the *Bacillus Bulgaris* and *Strepto-bacilli* *Leben*, and *Bacillus Causasina* and the *Long Bacilli* of *Mazun*, in (1) not growing in ordinary media, (2) producing a large amount of lactic acid in milk, (3) producing besides coagulation of casein and splitting sugar of milk into lactic acid, no other change in milk, (4) not producing any indol, nor peptone, nor saponification of fat nor formation of any gas.

3 It differs from the above by showing peculiar pink-stained granules, when stained with methylene blue and showing peculiarly convoluted chains in glucose agar.

4 The importance of the organism lies in the fact that, as in the case of *Bacillus Bulgaris*, it kills all pathogenic non-sporing germs and also destroys all proteolytic gas-forming bacilli in milk.

TABLE I

Table showing the amount of lactic acid produced by different lactic acid bacilli in 1 litre of milk, in terms of lactic acid,—the culture being kept at 37° C

Name of the bacillus	After 24 hours	After 48 hours	After 72 hours	After 96 hours	After a week	REMARKS
B Lactic acrogenes	18		10.08			Observed by Hall and Smith
B Coli Com munis	15		4.77			Do
B Bulgaris	12.8 - 4	16.5 - 4	20.2 - 4		22 - 4°	Observed by Gabriel Bertrand and Weisweiler the initial acidity of the milk was 4
Mazum Long streptococcus B	10.8	12				Observed by Duggeli
Streptococcus lebens	2.61*					Observed by Rest and Khoury
Streptococcus Dadli	10.8	10.9	11.25	11.70	18.5	Med Coll, Calcutta

* In their studies on Leben in the *Annales de Pasteur* Institut of 1899 Rest and Khoury in speaking of the amount of lactic acid produced by *Streptococcus lebens* in milk says "Nous avons mesurée l'acidité dans une culture sur petit lait de 24 heures elle était de 2.61 per cent exprimée en acide lactique" which will make the amount of lactic acid produced in 1 litre of milk 2.61 grms. The production of this small amount of lactic acid does not tally with the ordinary view of the vigorous lactic acid producing power of the bacillus

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ETIOLOGY OF DOUBLE QUOTIDIAN FEVER WITH SOME NOTES ON THE EARLY STAGE OF LEISHMAN DONOVAN INFECTION *

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By double quotidian fever is meant the fever characterized by two rigors taking place within

24 hours with two rises of temperature, there being a period of complete apyrexia between the two onsets, and this occurring not for one or two days as accidents in the course of other diseases, but as a distinct disease occurring suddenly in perfectly healthy persons uncomplicated with other diseases. The disease as such is not common, but still enough cases of this disease occur which, on account of its peculiar distinctive features, strictly regular periodicity of the double rise of temperature uninfluenced by quinine, its long course, and invariable fatal termination, ought to be ranked as a distinct disease.

It is, however, strange that no mention of it is found in any of the treatises dealing with Indian fevers.

Fayrer in his exhaustive book on the then known Indian fevers does not mention it.

Manson in his treatise on tropical diseases mentions a quotidian type of fever caused by unpigmented parasites, but does not mention the double quotidian.

Major Rogers in his treatise on Indian fever mentions that in some cases of early Kala-azar there is often a history of double rigors occurring in the course of 24 hours for some days as being remembered by the patients.

That this disease is not a recent arrival is proved by the fact that it is a disease well known to the old practitioners of Lower Bengal, who very much dread it on account of its invariable fatal termination, besides, the disease has been described in the well-known Sanskrit treatise *Susrutha* (32nd *Sloka*), as a *Bisama Jwar* (Grave fever).

In the course of the last five years, I came across 10 cases of this disease, the common peculiarities of these cases are that the persons attacked had been before the onset of the disease perfectly healthy, and with one exception, they are all residents of Calcutta.

1st case—Hindoo male, aged 16, resident of Calcutta, for four years, before the onset of the disease, got a sudden attack of high fever with severe ague at about 9 A.M. in the morning, the fever lasted for about 9 hours, temperature rising to 105.6° followed by another attack of fever of the same type, 3 hours after complete cessation of the first fever.

This went on regularly for over 18 months with slight occasional breaks, during which the fever became continued for a few days, after which it assumed its old type again. Quinine did not influence the fever in the least, and when excessive doses were tried, the patient became prostrated and there was a slight irregularity in the course of the fever. The patient, when not taking quinine, would go about freely during the time of intermission, and even after several months' illness, was not much prostrated. Examination of blood made 6 times during the whole course of the disease, showed no parasite, nor any abnormality in the

* Paper read before the Medical Section of the Asiatic Society, April 1909

count of the leucocytes, except during the last stage of the disease when there was found distinct leukopenia and relative increase of large mononuclear

For one year, the fever continued without showing any complications. Lungs were repeatedly examined, no noticeable change was detected. Spleen and liver showed no enlargement. At about the end of a year, the spleen became enlarged, and after six months it reached beyond the navel. A patch of dulness was found in the left base of the lung, due probably to thickened pleura.

After 18 months' continual suffering the patient died of general marasmus, swelling of the feet and some heart trouble. Only for a few days before his death, the double quotidian type was replaced by low continued type.

2nd case—A sister of the above case, aged about 16, had an exactly similar course, lasting over a year. In the last stage, enlargement of spleen and liver without any lung mischief and general dropsy set in. The blood examined several times during the course of the fever, gave similar negative results.

I may mention in this connection that a boy, aged 24, brother of the above two, a year after the death of the 2nd case, suffered from regular Kala azar fever and died of it. Another brother had also the same disease, and the fever is going on for over a year.

3rd case—The patient, a female, aged 20, living in Jubbulpur, got a sudden attack of double quotidian fever. Previous to the onset of this fever, she had been perfectly healthy. After a month's illness, she was brought down to Calcutta. The blood was repeatedly examined without showing any parasites.

In this case an alarming symptom was present. At the time when the temperature used to come down, there was profuse perspiration, temperature sinking down to 95.6 with all signs of collapse. After an illness of three months, during which the periodicity of the fever showed no change even for a single day, she died suddenly of collapse, without any complication setting in.

4th case—An adult, aged 40, an inhabitant of Calcutta, started getting double quotidian fever. During the period of pyrexia, he used to become depressed, as in the last case. I heard that the patient died nine months after with enlarged spleen and general anasarca.

5th case—An adult, aged 35, Hindoo male, an inhabitant of Calcutta. In this case, the temperature used to shoot up to 107°, when he used to become unconscious, there was albumen in the urine. Died a year after, the spleen being greatly enlarged at the time of death.

6th case—A Hindoo male, aged 30, used to live occasionally in a mofussil station, in a malarial district, and had some attacks of malarial fever, previous to this. He suffered from double quotidian fever for over nine months, and

died with enlarged liver and spleen, the spleen filling up the whole of the abdomen.

Several times the blood was examined, no parasites found, but there was distinct relative leukopenia, the white corpuscles numbering five hundred per cmm and the red corpuscles numbering 2½ millions. The spleen was punctured in this disease and any number of Leishman-Donovan bodies found.

7th case—An inhabitant of Calcutta, aged 40, Hindoo male, had a similar course as the above. Blood was examined, showed no parasites. Died after one year's illness.

8th, 9th and 10th cases are similar to the last two cases. The blood was examined in all of them with negative results. The disease lasting for about a year, the patients at death having enlarged spleens and livers.

From the accounts of the above cases, it may be gathered that this double quotidian fever is nothing but the early stage of Leishman infection, as it has been confirmed by the finding of the parasites in one case, and by the fact that in the family of first two cases which occurred in the same family, two cases of typical Leishman infection were found. In these two cases, the fever was of a continued type resisting treatment by quinine for over six months, before the enlargement of spleen and other signs of Leishman infection showed themselves. Indeed, it is strange that in studying the early stages of Kala azar, no single type of fever or a similar beginning was found in a large number of cases, one case differs from the others in many points, that it is difficult to diagnose the cases in the beginning, as it simulates other fevers like typhoid, etc. A series of types of fever in the early stage has been described in Major Rogers' book on Indian fevers. In this he mentions seven types of fever, namely (1) High continued fever, (2) Double remittent fever, (3) High remittent fever, (4) Low remittent, (5) Low continued, (6) High intermittent, (7) Low intermittent fever, and he mentions double remittent or double continued type of fever as the characteristic of Kala azar.

It appears, however, that even these seven types of early beginnings of Kala azar are not exhaustive enough, as the double quotidian type of fever is also the beginning of some of the cases, as has been described above. Besides several cases begin as true malaria with parasites and having slight enlargement of spleen, and then after a time Leishman-Donovan infection sets in and this type forms a large percentage of the cases. As both diseases produce enlargement of spleen and similar symptoms, it is very difficult to differentiate them. In one instance I drew out blood after puncturing the spleen of two sisters living in the same house having enlargement of the spleen similar in appearance, the enlargement not reaching down to the umbilicus, one showing numerous Leishman-Donovan bodies and the other numerous crescents.

In another case of enlargement of the spleen reaching below the umbilicus, I found by puncture innumerable malarial parasites. Indeed, it is strange that the two diseases which in their distribution occupy the same area and affect the same kind of people and produce similar pathological changes in the system, are not found together in the same patient at the same time, as up to now not a single case of such double infection has been reported. This is not due to want of observation for this particular fact, for the examination of the spleen for Leishman-Donovan bodies which are being conducted in innumerable cases by numerous observers would have shown the malarial parasites if they are present in the same slide in which Leishman-Donovan parasites are found as the methods of staining and examination are similar in both cases, the malarial parasites being more likely to be found in spleen blood than in the peripheral blood.

In a family living near Calcutta two cases of high fever coming every day with ague came under my observation from the very beginning, in one I found numerous rings of malignant tertian parasites, in the other no parasites were found. The first case was cured within a few days by quinine, the second is still continuing for more than three months, showing all the characteristics of Leishman infection, enlargement of spleen and characteristic blood change, quinine having no effect on the course of the disease.

In another instance, in a family, three cases of typical Leishman infection occurred with fatal terminations and one of black-water fever with similar termination, the whole family being literally wiped out. In two of the first cases the beginning was like ordinary malarial fever (quotidian type), and in both malarial parasites were found, in one benign tertian and in the other malignant tertian parasites. After several relapses the type of fever changed to low remittent type of fever, which could not be influenced by quinine. These two cases are typical instances of Leishman infection following malarial infection.

That this sequence of events is very common is proved by the fact that in the examination of spleen smears of all cases dying of suspected Leishman infection in the Medical College Hospital during the last 4 years, I found in most cases in which the Leishman-Donovan bodies were found as a rule, malarial pigment.

Though there are countries like Italy in which malaria prevails in an epidemic form where Leishman-Donovan bodies have not yet been found, yet these must be rare instances of its kind—the two diseases (malaria and Leishman infection) are, as a rule, found in the same locality. In Algeria even after the discovery of Leishman-Donovan parasite, descriptions of malarial cachectic cases are given with huge spleen protruding out of the abdomen as being

due to malaria. Only recently the observers there have started finding Leishman parasites.*

The following points require elucidation in view of the above facts—

(1) What is the relation between the malarial parasites and Leishman-Donovan parasites?

(2) How is it the two parasites are not found together in the same body at the same time, even if found, why is it so rare?

(3) Is there any such thing as true malarial cachexia?

(4) If so, what is the difference between it and the cachexia produced by Leishman bodies?

(5) Whether large numbers of cases of Leishman-Donovan infections are not sequelæ of true malarial infection?

(6) What proportion of cases of Kala azar begin as such and not follow malarial infection?

Elucidation of these problems will be of great help to those Sanitary Officers who have to deal with malaria and Kala azar epidemics. They know how to deal with malaria in the light of recent discoveries, but are powerless against the Leishman infection.

A Mirror of Hospital Practice.

INCARCERATION OF A RETRO DEVIATED PREGNANT UTERUS RE-OPENING OF A PARTIALLY OBLITER- ATED URACHUS

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VOTI, H. F., M.D., *æt* 32, inhabitant of Nepal was admitted to the Victoria Dispensary on 15th May 1908. She had given birth to seven children, the youngest of whom was three years of age. For the past four months she had not menstruated, and believed herself to be pregnant. Two days prior to admission, complete retention of urine occurred, her abdomen became distended, and she was in great pain. On the second day, in a paroxysm of pain, she threw herself violently on the ground, and at the same time strained hard to pass water, with the result, that urine suddenly escaped through the umbilicus, and has continued to do so up to the time of her admission.

On admission—The bladder was distended and blood-stained urine dribbled from a small hole at the umbilicus, which was otherwise normal in appearance. A long probe pushed into this opening, passed straight down in the midline to the bladder, where it could be detected by a catheter, passed with some difficulty through

* An observer has described very recently typical cases of Leishman infection in Sicily, which have been confirmed by spleen puncture.

the elongated urethra. A retroverted pregnant uterus was found completely filling Douglas's pouch, and pressing on the rectum. The bladder having been emptied—under chloroform—an ineffectual attempt was made to reduce the uterus by pressure through the vagina. Subsequently with some difficulty it was reduced by two fingers passed into the rectum. A pessary was inserted into the vagina, though considering the size of the uterus its introduction was perhaps, unnecessary. Some atony followed the extreme distention of the bladder, and the urine, which was blood-stained and contained a few superficial sloughs, had to be drawn off for several days by a catheter. Later urine was passed both by the urethra and through the umbilical opening. The opening at the umbilicus was not completely closed till the 24th June, on which date the patient was discharged cured.

The patient promised to return for her confinement, but failed to do so. Enquiries showed that she went on to term, and was delivered of a living child.

There were no signs of inflammation about the umbilicus, or abdominal walls, the trick as shown by the probe was a narrow one, and went straight down in the mid line to the bladder, and I think there can be no doubt that the violence inflicted by the patient on herself caused the re-opening of a urachus which could only have been partially obliterated. This accident possibly saved her life, situated as she was a long way off from any medical assistance.

NOTES FROM THE HUGHLI HOSPITALS, 1903—1909

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I Case of Ulceration of Stomach—Hail Ghose, Hindu male, 52, No 6744A, while under trial in Court at Chinsura on 6th November 1903, was attacked by violent hæmatemesis. He was convicted and sentenced to three months' rigorous imprisonment under section 379, Indian Penal Code, (theft), on the same day, and sent into Jail, "in a dying condition," as noted by my predecessor, collapsed, temperature below normal, pulse weak and thready, respiration hurried, unable to answer questions, spleen enlarged, lungs healthy. He was given a mixture containing quinine, tincture of ergot, and laudanum, also rum, and spiritus ætheris. On the 7th and 8th he passed one motion each day, consisting chiefly of dark altered (tarry) blood. On the 9th his temperature rose to 104 in the evening, subsequently it varied from normal up to 100, until a few hours before death, when it rose to 100.4. On the night of the 11th he passed eight motions, chiefly dysenteric, blood and mucus, but also containing some tarry altered blood. I took over charge of the Civil Surgeoncy and Jail at Hughli on 12th

November 1903, when I saw him for the first time. He continued to pass similar motions, mostly dysenteric, a few tarry, from five to nine per day, until his death, which took place at 1 A.M., on 22nd November.

Post-mortem, 9 A.M., 22nd November, eight hours after death. *Body* thin, but hardly emaciated. *Lungs* healthy. *Heart* healthy, right auricle full of decolourised antemortem clot, a little similar clot in left ventricle. *Spleen* much enlarged, firm and solid, "ague cake," nine inches long, five broad, three thick, capsule over outer surface much thickened and of a dull white colour. *Kidneys* healthy. *Liver* healthy, gall bladder contained about 51 dark brown bile. *Stomach* contained over a pint of dark fluid, partly milk and water, partly altered blood. The posterior surface, near the greater curvature, was deeply pitted with small ulcers, between twenty and thirty in number, varying in size from that of a pin's head to that of a split pea. *Intestines*, small, congested in parts, coats thinned, large, coats thickened and deeply ulcerated throughout its length, the ulcers lined with small grey and black sloughs.

II Case of Amnium—Kishore Das, Hindu male, 40, came to the Imambara Hospital, Chinsura, on 27th November 1903, suffering from amnium of the left little toe. The toe was about thrice the normal size, with a deep narrow constricting ring round the base. He stated that about two years ago he had a fall, subsequent to which an ulcer developed under the left little toe, and gradually the constricting ring formed. The toe was now connected with the foot only by a narrow pedicle, about the calibre of a crowquill. This was divided with scissors, slight oozing only followed.

Remarks—Amnium is decidedly an uncommon disease in Bengal, and I believe does not occur in other parts of India. It is seen among Negroes in Brazil and in tropical Africa. I have not seen more than some half dozen cases, of which the above was the last, during my service. Amnium is not mentioned by Morehead (1). The disease was described for the first time in India, in 1873, by Dr James Wise, of Dakka (2). The late Lieutenant-Colonel Crombie reported two cases in the *Indian Medical Gazette* in 1873 and 1874. I reported two or three cases in the *Edinburgh Medical Journal* in 1885. Chevers (3) mentions Crombie's and Wise's cases, also another reported from Bhagalpur by the late Lieutenant-Colonel C J H Warden. A very good description of the disease, with a plate, may be seen in Manson's *Tropical Diseases* (4). Sir Patrick Manson also contributes a short article on the subject to the latest (third—1902) edition of Quain's *Dictionary of Medicine*.

III Amputation of both legs for railway accident—Kisto Chain Roy, Bengali male, 15, was run over by a goods train about 5 P.M.

on 28th January 1904, the train passed over both legs below the knee, crushing them to pieces. He was brought into hospital about 11-45 P.M., and seen soon after midnight. On admission he was pulseless, and appeared moribund. Both legs were amputated, the right just below the knee-joint, the head of the fibula being disarticulated, the left at its middle. Next morning the pulse was perceptible, but very feeble. He recovered gradually. The flaps of the right stump sloughed, and the wound gradually healed by granulation. The left stump healed well, but the cut edge of the tibia, perforating the flap in one place, caused a small ulcer, the size of a four-anna piece, through which bare bone could be felt. On 15th April a small fragment of dead bone was removed from this spot, after which the ulcer healed in a few days. He had also a small wound on the right lower jaw, just in front of the angle, which remained open until 2nd April, when four small pieces of dead bone were removed from it, after which it healed in a few days. He was discharged cured, with all wounds soundly healed, on 21st April 1904.

Remarks—This unfortunate boy must have lain unnoticed at the side of the line for between five and six hours after the accident, allowing one hour for his conveyance to hospital, when found. The place where he was run over was on the east side of the Jubilee bridge over the Hughli, on the Bandel-Naihati branch of the East Indian railway. Though within about a third of a mile, as the crow flies, of Hughli Jail and of a thickly populated part of the town, it is on the other side of the river Hughli, the actual locality being at that time almost uninhabited. When I left the hospital, after amputating both legs, in the early morning of 29th January, I did not expect to see the boy again alive.

IV Case of mycetoma, or fungus foot—Sheikh Itaj, Musalman male, 65, of Narayanpara, Polba, was admitted on 22nd April 1904, suffering from mycetoma of the left heel, said to be of two years' standing. The tumour was situated beneath the foot, at the anterior part of the heel, it was circular, $1\frac{1}{2}$ inches in diameter, and on excision was found to be half an inch thick. He had also a large gland about the size of a lemon, in the left thigh, over Scarpa's triangle, said to be of one month's standing. On 23rd April, under chloroform, the tumour of the foot was excised, at the same time the gland in the thigh was shelled out through an incision made over it. The gland tissue was softer than normal in consistence, and black as ink. The wound in the groin had healed by 15th May. He was discharged at his own request on 23rd May, a small flat ulcer on the heel remaining.

He appears to have remained free from the disease only for about two months. He was again admitted on 27th September 1904, with a tumour over the left Scarpa's triangle, in the same

situation as the gland removed in April, the size of a large clenched fist. No recurrence on heel. He stated that this tumour first appeared about two months previously, and that about ten days before admission he picked it with a knife, when some black blood came out. The tumour was freely movable, it had two ulcerated spots on its surface, through which black slough was visible, the skin over it was sodden and cedematous. On 28th September, under chloroform, the tumour was excised. After making a line of incision through the skin round the base of the tumour, the greater part of it was removed without difficulty by the fingers. The subcutaneous cellular tissue of the thigh, however, was affected for some distance down, also processes of similar black tissue extended down between the femoral vessels, the femoral vein was also affected, and gave way on handling, two inches of it had to be excised between ligatures. A counter-opening was made on the inner side of the thigh, three inches below the wound, a drainage tube put through it, and the wound stitched over the tube. All the tissues which were discoloured were removed, but a good deal more of the subcutaneous cellular tissue appeared to be thickened. He never recovered from the shock, and died at 2 P.M. about four hours after the operation.

Remarks—Mycetoma is certainly not a common disease in Bengal. I have seen some half a dozen cases during my whole service, and the case described above is the second on which I have operated at Hughli. The first case was reported in the *Indian Medical Gazette* of May 1903(5). In that case also the disease was situated on the heel, but on the right, not on the left side, and in that case also the glands in the groin of the corresponding side were affected. Chevers(6) says that he only saw one case in the whole of his service, a man from Burdwan, a Musalman agricultural labourer. Both the cases I have seen at Chinsura were Musalman agricultural labourers. Chevers adds "It is very remarkable that, as far as I am aware, no other case of this disease (which, if it occurred, could hardly be overlooked) has been reported as observed in Lower Bengal. Western Burdwan is out of the Gangetic delta, and its soil is not alluvial." Hughli, on the other hand, is certainly a part of the Gangetic delta, and its soil is alluvial.

In some parts of India, however, mycetoma is very common—in Rajputana and Madras, so much so in the south, that "Madras foot" is one of the commonest names of the disease. Vandyke Carter published an elaborate monograph on the subject, a quarter of a century ago.(7) Lewis and Cunningham also wrote a report on this disease(8), as well as contributing the article on "fungus foot" to the second edition of Quain's *Dictionary of Medicine*. It is also one of the diseases treated of in Fox and Farquhar's "*Endemic Skin Diseases of India*"

V Case of Elephantiasis Scroti, with Epithelioma of Penis—Kedar Nath Sen, Hindu male (Teli), 50, was admitted on 25th June 1904, with elephantiasis of the scrotum, said to be of two years' standing, but from its size evidently much older. The urine was free from sugar and albumen. No sign of penis visible, it was concealed in a mass of warty growth. The tumour was excised, under chloroform, on 27th June. On dissecting out the penis it was found that the under part of the body of the organ, beneath the glans penis, was disorganised, and converted into an abscess, containing about an ounce of pus, the tissue also was epitheliomatous. In addition to excision of the elephantoid tumour, the penis had to be amputated. The urethra was separated from the corpora cavernosa, which were ligatured. The sides of the wound, above the urethra, were brought into apposition with catgut sutures, the corpora cavernosa being covered in, and the sides of the wound below the penis were approximated, over the testicles, by similar sutures, a drainage tube being passed through the wound from top to bottom. A No 6 gum elastic catheter was passed into the bladder, and the cut edges of the urethra were stitched to the lips of the wound. The operation lasted fifty minutes, the part of the penis removed weighed $\frac{3}{4}$ lb, the rest of the mass removed weighed 2 lb, without counting a large quantity of blood and serum lost. The tunica of each testicle contained about 3 viii fluid. The case did well up to the morning of the 10th July when the wound was healing well. The upper half of the wound, above the penis, was open to some extent, but was quite clean, and granulating healthily, the lower half, the scrotal wound, had almost healed. On the morning of 10th July he was talking cheerfully, whilst being dressed, when he suddenly fell back, and died instantaneously, presumably from heart failure. He had no murmur of the heart, but his pulse had always been slow and weak since the time of admission, before operation.

Remarks—The result in this case was very disappointing, as the man seemed to be quite out of danger at the time of his death. I had never before seen, nor even heard of, elephantiasis scroti and epithelioma of the penis co-existing in one patient. Such a case has, however, since been reported by Major J T Calvert, RMS, in an article in the *Indian Medical Gazette* of May 1905 (p 102). The diagnosis of epithelioma of the penis does not rest on my own powers of observation, though the cauliflower appearance was plain enough, I sent the specimen to the Pasteur Institute at Kasauli, where the diagnosis of epithelioma was confirmed.

VI Case of Fracture of Spine (?)—Ramjan Sheikh, Musalman male, 26, sentenced to one year's rigorous imprisonment at Serampur on 12th November 1904, and admitted to Hughli jail on 14th November 1904.

History—About two months before, he went into a house to steal and made his way to the upper story, was detected, and jumped down to the ground, in so doing was severely injured, and, being unable to rise, was caught, since then has been unable to stand or walk.

Condition on admission—Apart from injuries, health good, a strongly built man, weight 117 lbs, cannot walk, can stand unsupported for about a minute only. All joints freely movable, no sign of any fracture of lower limbs, no swelling along spine, nor pain on percussion, passes urine and faeces involuntarily, an anaesthetic patch on buttocks, no other symptoms of paralysis.

By 14th December, one month later, he had regained control over his motions, but not over urine. On 31st December 1904 he was discharged to the convalescent gang, still without proper control of urine. The power of controlling miction returned very gradually. He was released in fair health on 26th October 1905, weighing 127 lbs.

Remarks—It must be admitted that the diagnosis is very doubtful, the case was first seen about two months after the original injury. I did not expect him to make a perfect recovery when I first saw him, and the final result was better than could have been expected at the time of his admission. His subsequent history shows that recovery from his physical injuries was complete. He was again admitted to jail on 31st July 1906 with a sentence of 1½ years, weight 117 lbs and released on 28th December 1907, still weighing 117 lbs. He was less than one month out of jail this time, for he was again admitted on 22nd January 1908 with a sentence of two years, weight 120 lbs, and was placed on medium labour. On 4th October 1908 he was transferred to hard labour, weighing 123 lbs, and at the time of writing, has been doing hard labour, chiefly wheat grinding, for over nine months.

VII Case of symmetrical enchondroma of hip—Constable A K B, Hindu male, 35, was admitted on 3rd September 1904, with a cartilaginous tumour, about the size of a walnut, situated over the great trochanter of the femur on each side. The two tumours appeared to be exactly the same, and he said that both had made their first appearance at the same time, about ten months before. That over the left hip was removed the same day under chloroform. The wound healed slowly by granulation, he was discharged cured on 12th October 1904. He was again admitted, three months later, on 12th January 1905, and the tumour over the right hip was excised, under chloroform. Again the wound healed slowly by granulation, he was discharged cured on 19th February 1905.

VIII Case of herniotomy for strangulated hernia—Bechu Ruidas, Hindu male, 55, admitted on 10th October 1904, with right inguinal hernia, said to have existed for about six years, and to have been irreducible for six days past.

vomiting offensive matter, pulse feeble. At 9 A M the same day, under chloroform, an incision was made over the ring, the intestine disappeared into the abdomen, and was not seen on opening the sac, which was tightly ligatured, the stump pushed inside the ring, and the ring and external wound sewn up. Next day the pulse was stronger, no tympanitis, he passed flatus in the morning, and a stool in the evening. Temperature at the time of operation was 100, the highest temperature was 102 on the evening of the 12th, on 15th October it had come down to normal, and did not rise again. On the 15th there was a very offensive discharge from one of the stitch holes. On the 17th October a large collection of very foul pus was evacuated from the right iliac region. The original herniotomy wound, though close to the new wound, was not affected, and had healed by 17th November. The second wound was soon reduced to a long sinus, which was treated by injection of nitrate of silver, tinctura iodi, etc., without much success. On 8th December the sinus was laid open and scraped, by 18th December it had healed, he was discharged cured on 19th December. He was seen again on 5th March 1905, wound soundly healed, no descent nor bulging of the bowel on coughing.

Remarks—It was remarkable, as well as fortunate, that the herniotomy wound remained clean and sweet, though in close proximity to the very foul abscess in the iliac region.

IX A case of cut-throat—Kushai Keoria, Hindu male, 30, was admitted to the Imambara Hospital, Chinsura, on 23rd May 1905, suffering from an ischio-rectal abscess on the right side. He was in a very low state of health, and had a protracted convalescence after the abscess was opened, which was done at once. On the early morning of 21st June he cut his throat, with a blunt penknife, borrowed from another patient. I was sent for at once, and reached the hospital about 4-45 A M. He had a wound, two inches long from side to side, gaping one inch broad from above downwards, opening into the pharynx, between the hyoid bone and the thyroid cartilage. There was not much bleeding. The wound was stitched up at once, under chloroform, two stitches were put in the thyroid cartilage and thyrohyoid membrane, and four superficial stitches in the skin. This wound healed rapidly, but the ischio-rectal abscess took a long time to heal. He was finally discharged cured on 31st July 1905.

X Case of multiple exostoses—Hazarai Biswas, Hindu male, 28, was admitted to the Imambara Hospital, with a sinus over the left hip, on 25th September 1905. He stated that he had had a fall five months before, since when his hip had been stiff. On examination a number of exostoses were found in different parts of the body.

- (1) Behind great trochanter of left, femur the largest, nearly as large as an egg, rounded
- (2) Inner side of left femur, three inches above condyle
- (3) Outer side of left femur, three inches above condyle
- (4) Behind upper part of inner condyle of left femur, small
- (5) Over inner condyle of left tibia
- (6) Outer side of right femur, three inches above condyle
- (7) Inner side of right femur, 1½ inches above condyle
- (8) Over inner condyle of right tibia
- (9) On 8th left rib, in nipple line, small
- (10) In middle of front of right humerus
- (11) In front of left ulna, 1½ inches above wrist-joint, small

The left knee could not be fully extended, but could be fully flexed. The left hip could only be flexed and extended for a very short distance, and its circumduction movement was very limited. The movements of the right hip and knee, and of the other joints, were perfect.

Nos 1, 9, and 11 were rounded, the two last very small, about half an inch in circumference. The others were ridges, about 1½ inches high and 1 to 1½ inches in length. They felt like ossified insertions of muscles, but did not correspond to places of muscle insertion.

On 30th September 1905, the sinus was enlarged, under chloroform, and the forefinger inserted. It came on a deep furrow, between two high ridges of bone, the bone was bare, but not necrosed. The surface of the bone was scraped, and the wound plugged. The wound healed, he was discharged on 9th November 1905 *in statu quo*.

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Indian Medical Gazette

SEPTEMBER

THE CAMPAIGN AGAINST MICROBES

HERE in India it is hard indeed for the practitioner to keep abreast of the progress that is being made in medicine. Everyone has his own special leanings, and subscribes to that periodical which deals more particularly with the branch of medicine in which he takes most interest. But one should in the nature of things have more catholic tastes here than at Home, and most of our readers must have at one time or another sighed for a succinct and reliable account of the way in which our knowledge has grown with regard to the problems presented by many diseases for which until recent years there was no cure, and what is more, apparently no means whereby a remedy might eventually be found. Text-books there are, of course, in plenty, and to spare, but to read, mark and inwardly digest the contents of a voluminous treatise on cancer, tuberculosis, etc., takes time—and in too many cases the text-book is used merely as a work of reference, when some peculiarly difficult case comes to be considered, and the opportunity for obtaining a knowledge of the salient points of a problem is thus lost or at best deferred.

It will be good news to our readers that the well-known Zoologist Austen has translated the work of Etienne Burnet, "The Campaign against Microbes".* In small compass there is here given an admirable rendering of an account, clear as only a Frenchman could make it, of the way in which in recent years the problems presented by cancer, tuberculosis, tetanus, sleeping sickness, and intestinal disorders have been, and are being, elucidated.

The statistics collected with such care by Behla and by Kolb of the prevalence of cancer in certain localities, the facts that negative hereditary transmission of the disease, the classical experiment of Moir, which has led to such far-reaching work on cancer inoculation, the transformation of carcinoma into sarcoma during a series of passages through mice, the probability of the invisible microbe, as against

the cell, being the cause of the disease these points are all fully dealt with. The rise and fall of bovine vaccine, the experimental proof that the bacillus of tubercle is swallowed and not inhaled, though it affects the lungs, and the more convincing experiments that show that it is both swallowed and inhaled, the uses of tuberculin-vaccination, and the comparative uselessness of anti-tubercular sero-therapy—on these subjects the reader will find clear information briefly put. Incidentally mention is made of Pasteur's suggestion that, for the study of certain diseases that require for their full elucidation the performance of experiments on human beings, condemned criminals might be reprieved and used for the purpose.

It is probable that those who are deemed by our grandchildren to merit elimination will be thus devoted to the cause of science and humanity. Assuredly more benefit is to be looked for from thus utilizing heinous offenders than from doing them to death at the hands of the public executioner, a plan that has been adopted for the past six thousand years without tangible results to humanity having accrued.

The discovery that tetanus is inoculable, which preceded the discovery of the bacillus of tetanus, the exceedingly poisonous nature of the toxin excreted by this bacillus, the difference between the toxin-laden spores that are obtained by cultivating the bacillus on suitable media in the laboratory, and the "pure" spores of the bacillus that are omnipresent in nature, the rôle played by the phagocytes in protecting the organism against these "pure" spores, and the explanation of the fact that when these spores are introduced along with gross dirt, or find a lodgment in the spot where a subcutaneous injection of quinine has been given, they germinate and the bacilli that grow from them produce the disease—on all these points the reader will find clear information in the section that treats of tetanus. Here too he will find the explanation of the fact that while both antidiphtheritic and antitetanic sera are really prophylactic in their action, the former appears to be "curative." We have in diphtheria early information of the presence of the toxin, and are able to neutralize it before it has become fixed by the central nervous system. What has become fixed cannot be neutralized, and thus no amount of antidiphtheritic serum is of any use in cases of post-diphtheritic paralysis. In tetanus the first information that

* The Campaign against Microbes, by Etienne Burnet, M.D., translated from the French by E. E. Austen, F.Z.S.I. London, John Bale, Sons and Danielsson, 1909. Price, 5s net.

we have of the presence of the toxin is afforded by the occurrence of trismus which is but evidence of the fact that the toxin has already become fixed by the central nervous system, and cannot be neutralized for this reason.

After reading the short account given of what has been done to study sleeping-sickness, to attempt to stop the spread of this disease, and to relieve its victims, one is better able to enjoy the perusal of a "heavy" article on the subject.

Naturally Burnet is a convinced adherent of Metchnikoff, so we have a clear account of the way in which our ideas regarding "enteritis" have undergone revolution at the hands of the microbiologists, who have shown us how best we may prevent intestinal fermentation.

Lastly, we have an account of Variola and Vaccinia, written from the popular standpoint, and so clearly that even the egregious Lupton and his like could understand it, and might by its perusal be led to entertain correct ideas regarding the causation and prevention of small-pox. Appended we have an abridged reprint of the second edition of Jenner's *Inquiry*, which will, we feel sure, be read with interest by all residents in the tropics, where the living proofs of the ravages caused by want of protection against small-pox are so many and so hideous.

THE TRANSMISSION OF AFFERENT IMPULSES

ONE of the most distinguished guests at the Twenty-sixth Medical Congress held in Wiesbaden was Professor Dr. Head of London and the interest aroused by his lecture on sensibility and the testing of sensibility was manifested by the deep attention of a crowded room. Head has done pioneer work and is an authority of world-wide renown, it may justly be said that his researches have entirely revolutionised our views about afferent impressions, his results are already in the main accepted.

He points out that there are three channels for the various varieties of sensations from the periphery. First, that for deep sensibility, secondly, that for what he terms the protopathic, and thirdly, that for the epicritical.

By means of the first we appreciate deep pressure and, when it is excessive, pain and localise these sensations. We also can appreciate alterations in the positions of the joints, muscles and tendons. The fibres subserving this form of sensibility run with the muscle nerves.

The protopathic fibres enable us to appreciate painful cutaneous stimuli, to respond to extremes of heat and cold, *i.e.*, below 20°C and above 40°C. It does not tell us, however, how hot or how cold. It is the form of sensation with which the viscera are supplied—it is well-known a patient cannot tell from the sensibility of the mucous membrane of the rectum whether an enema is hot or not unless the temperature is above 115°F. The painful sensations from a prick or a strong electrical current are also conveyed by the protopathic fibres, but the sensation is diffused and cannot be localised. The fibres which transmit heat and cold are distinct from one another, there are hot and cold spots which can be accurately mapped out on the skin when it is deprived of its epicritical sensation, so that a hot or cold substance applied to the skin between those spots does not arouse any sensation of temperature at all.

By the epicritical fibres one appreciates a light touch and discriminates its character for instance, whether touched by one or two points of compasses, and how far those points are apart. By this channel also one can appreciate whether a surface touching the skin is smooth or rough and its position can be accurately localised, also by its slight differences of temperature can be detected.

Both protopathic and epicritic sensibility are transmitted by the sensory cutaneous nerves, but they differ in several respects. The protopathic fibres correspond very much to the posterior nerve roots, and the various nerve roots overlap one another considerably. Epicritical sensation is regulated by the peripheral fibres and there is very little overlapping.

Head experimented on himself by having a portion of the radial and external cutaneous nerves excised and resutured. By means of the most exact methods he was able to observe the ensuing disturbances of sensibility and also the setting in of regeneration. When the peripheral nerves have been cut, the disturbances of sensibility are not such as would be expected from the anatomical origin of the nerves. We are accustomed to speak of certain characteristics of sensibility, we perceive a sensation of touch which gradually merges into painless perception of pressure. Pain, heat and cold, sense of localisation, etc., are uniform characteristics distinctly divided from one another. Such different types of sensibility

are acknowledged to be dependant on different impulses. Every attempt, however, at classifying under preconceived categories the disturbances of sensibility ensuing after injuries to the spinal cord or of the peripheral nerves, fails owing to a contradiction of the actual condition. Once the peripheral nerves are cut, the phenomena of sensibility differ entirely from those occurring in cases of lesions of the spinal cord or brain from which these nerves originate.

These difficulties disappear as soon as one assumes that during the transit of the impulses to the brain a transformation takes place. After the operation on his own nerves the region affected was only supplied at first with deep sensibility. The protopathic and epicritical fibres regenerated unequally. After seven weeks he began to recover his protopathic sensation, and in about seven months it was practically complete. He did not begin to recover his epicritical sense under ten months and after about a year that also was again complete. There were, therefore, three distinct periods in which he was able to study the various sensory disturbances.

The sense of pain is the first to reappear, then that of heat and cold, and only about a year later the sensibility of the higher stages is restored. Having obtained this basis from his own experience he investigated a very large number of cases from this point of view and collected a large amount of material which justifies him in presenting a theory giving a very much more accurate view of our afferent sensations than we have previously had.

Head thinks that, corresponding to the regeneration of the sensibilities, the innervation of the skin is supplied by three different systems, and that the development of sensibility has taken place gradually. We are born with our protopathic and deep sensibilities, the epicritical is a matter of education and development, such development consists in the gradual perfecting of the sensitive impulses at every stage of the higher developed nervous system. When the epicritical sensibility is absent there is no power to control the reflexes. A child is constantly on the move, and is so, because the epicritical sense is not developed. When it is developed, the child's movements become controlled and the reflexes are not allowed un restrained play.

Now, how do these various fibres run in the cord? First we have to bear in mind that they

are arranged, all touch sensations are collected together, so deep pressure and epicritic touch sense will be joined into one tract. Painful sensations, whether protopathic or deep, will be aggregated in another tract, and temperature sensations, whether epicritic or protopathic, will be in a third. Therefore if, with a spinal cord lesion, the appreciation of touch is lost, that of pressure will also be absent. If in a spinal cord lesion any sensation of temperature is appreciated, all temperatures will be appreciated. If pain is lost from any cause, it will be lost from all causes. These views explain many things that were previously obscure, as it never seems to have occurred to anyone that there was this shunting of fibres soon after they enter the spinal cord.

The only fibres that run any distance homolaterally in the posterior columns, *i.e.*, without crossing over, are those which regulate passive movements and position with consciousness, and those of tactile discrimination.

Homolaterally, also, in the direct cerebellar tract run the unconscious impulses regulating co-ordination and muscle tone.

Fibres having the same function run heterolaterally in the ventral spino-cerebellar, or Gower's tract.

In the spino-thalamic tract, internal and anterior to Gower's tract, run the crossed fibres for pain, heat and cold, while the fibres for touch and pressure run in the anterior columns, also heterolaterally.

The distance the various fibres run before they cross varies, and hence the complexity of the sensory disturbances in spinal cord lesions. The fibres conveying painful sensations from any area due to pressure do not enter through the same nerve roots as the protopathic painful sensory impulses enter.

These results and observations mark a decided advance in our knowledge of the physiology of afferent impulses, and their clinical application will afford immense assistance in the localisation of lesions of the central nervous system and peripheral nerves.

Current Topics.

THE FOCHIER FIXATION ABSCESS

It has long been a matter of clinical observation that in serious septicæmic conditions such

as influenza, small-pox, scarlet fever, pneumonia and allied disorders, but specially in puerperal fever the appearance of a localized suppurative process has been the signal for general improvement and even recovery.

With this fact as his point of departure Professor Fochner of Lyons, in 1892 advanced the idea that cure of such conditions might be brought about by the deliberate creation of an artificial abscess. Using spirits of turpentine as his irritant, he injected it beneath the skin at a part of the body where an abscess would do the least harm, would give as little pain as possible, and would be most accessible for dressing. He found that his reasoning was correct, for in cases of puerperal fever the abscess he created put an end to a situation apparently desperate and was followed by recovery. In fact the immediate prognosis for the patient is indicated by the effects of the injection: the livelier the reaction, the better the outlook, when all reaction fails, the patient is certain to die.

When this idea was first published it was received with thinly disguised incredulity. After a few fitful trials it fell into apparent disuse and for a while nothing was heard of it. Of late, however, it appears to be coming to the front once more, this time in Paris itself. Thuroloz and Boissard have both written on the method with marked approval.

The injection must be made in an absolutely aseptic manner as, from beginning to end, the abscess must be merely chemical and non-infectious. It should not be intra-muscular but should be in the loose cellular subcutaneous tissue. Pure spirits of turpentine should be used, the amount varying from one to four or five cubic centimetres.

A curious detail about the method is the importance of the time at which the abscess so formed should be opened. When the result is satisfactory in every way, a big reaction has taken place and the patient is manifestly out of danger, the abscess may be opened as soon as it is ripe, but in dubious cases, with partial results only, it is sometimes desirable to create a second abscess on the other side before treating the first, otherwise the patient may lose the ground gained.

A great deal of controversy has arisen regarding the class of case in which this method is to be used, and the stage in the disease at which the injection is to be made.

It is self-evident that the method is one that is only applicable to severe cases—where local douching and cauterizing suffice they should be relied on. It should, therefore, be reserved for severe cases. Boissard's definition of such cases is as follows—They are those in which the means that succeed in most instances have been tried and have failed—cases where one feels that one is not only not gaining ground, but actually losing it. In such cases as these try the injection

and try it at once, do not wait until the patient's power of reaction is entirely gone.

In spite of the various attempts that have been made to give an explanation of the manner in which this method acts, there is apparently no one that has any serious basis. To look on it as a modification of the ancient device, counter-irritation, as some have done, does not seem permissible. Others have thought that the pus called forth may act as a species of depurative and free the system from the germs and toxins of the circulation, but the pus on examination has proved to be sterile and tried on animals has been found to be no more toxic than any other form of suppuration. So this hypothesis must apparently be eliminated.

It has, again, been thought that the aseptic abscess created may produce general hyperleucocytosis, and in this way stimulate phagocytosis and the cleansing of the blood of the foreign germs. One of Boissard's cases seems to substantiate this idea, but the increase in leucocytosis was not very great and no great increase is to be found in successful cases.

Fabre of Lyons is the only one who ascribes the therapeutic results to the spirits of turpentine itself.

The results given by this method of treatment are spoken of very highly, and when we bear in mind that generally the turpentine injection (and this Boissard thinks is a mistake) has only been used *in desperation*, when all other means had failed, and yet, the physician felt that he could not look on with crossed arms, but must at least appear to be acting, the successes registered are all the more convincing. It seems fair to expect that, if the method is applied boldly and promptly, according to Boissard's rule, the results will be more satisfactory and convincing still.

(*Paris letter "Spectator" Boston Medical and Surgical Journal*)

MALARIAL PROPHYLAXIS

The following brief summary of Colonel Brade's report on quinine administration will be of interest to most of our readers—

MALARIA—A special report was submitted to Government on the subject which I will as briefly as possible summarise here.

(a) Every few years a virulent outbreak of "fever" occurs affecting practically the whole population of the Punjab. Such a year was 1908 in which it is computed that 9 per cent suffered and half a million people died from malaria.

(b) The daily population of the jails of the Punjab was 12,045 in the past year and there were recorded 1,864 cases of malaria with five deaths, these 1,864 admissions were distributed amongst 1,200 prisoners approximately, and many of these were brought under treatment within a few days of their admission to jail and before they came under our special measures of protection. That is to say 10 per cent exhibited malaria and the five deaths may be disregarded inasmuch as the cause of the fatal issue was doubtful in every instance.

(c) *Contrast between prisoners and the free population*—Ten per cent against 90, still more vividly shown by the following three out of many instances—

(1) In Mianwah 33 per cent of the entire free population actually applied for relief at the Civil Dispensary, in the jail there were but two cases of malaria or 1 per cent

(2) In the schools of Ludhiana 85 to 88 per cent of the scholars absented themselves on account of malaria, in the jail 3.84 per cent suffered

(3) At Ambala the incidence of cases in the Police Lines was 2,408.13 per mille of average strength, in the jail near by it was 8.30

(d) *Cause of immunity of prisoners*—Is briefly discussed under three heads—

(1) *Sanitation*—This has been of a high order for years past, its state is little different to what it was 20 years ago, yet I find that in 1890, that is before quinine was used, there were 11,934 admissions from ague and 16 deaths in jails of the Punjab. Further, prisons are not favoured by locality, at Gujrat, Jullundur and Ludhiana, the jail is part of the city and in Amritsar it is situated in a swamp

(2) *Mosquito campaigns*—None were attempted except at Amritsar, where it was carried on throughout the year by a Medical Officer who appears to thoroughly believe in these measures, here is his own summing up "both the establishment and the prisoners were under the influence of large sheets of water in the proximity of the jail and at the end of November the prisoners were practically malaria free whereas the establishment was a sickly miserable lot and had to be given frequent spells of leave", the former were protected by quinine, the latter were not

(3) *Quinine prophylaxis*—Every Medical Officer in the Punjab places this measure first and foremost as the cause of immunity

(e) *What quinine can do*—Every prisoner in Hissar jail received 10 grains of quinine on admission to jail and 15 grains every seventh day during the autumn months, out of a daily average of 186 prisoners one case of ague was recorded during 1908, and the Medical Officer says that case missed his admission dose these are facts, I have personally investigated them. The above and the experience of jails generally brings out this deduction, take quinine systematically and one is absolutely malaria proof, there is no need for any other expedient

THE EFFECTS OF HEATING OF MILK ON THE NUTRITION AND HEALTH OF THE INFANT

DR I. M. FORTESCUE-BRICKDALE (*Brit Med Clin Jour*) deals with the alteration in the physico-chemical character of milk produced by heat. These alterations he classifies in three groups. The first group consists of the obvious changes,—changes in taste and colour (due to the action of heat on lactose) and the formation of a "skin" (due to the drying of protein on the surface). These changes are not of great importance as regards the infant. The next group consists of changes not appreciable by the ordinary observers, namely, the precipitation of calcium, and alterations in the organic phosphorus compounds. The former renders the caseinogen less coagulable *in vitro*, but it is not certain if the same effect is produced *in vivo*. It appears, however, that heated milk is less easily acted on by pepsin and trypsin, and in all probability less easily absorbed, specially by young children.

The physiological effect of the alterations in the phosphorus is not certain, but as cow's

milk is poor in organic phosphorus bodies, and these seem very needful to the human infant, heating may be considered to act detrimentally in decomposing these compounds.

The third group of changes, the least easily detected of all, are those which concern the "vital" properties of milk. Enzymes, agglutinins and precipitins, bodies presumably of value to the infant, are destroyed, and phagocytosis by the milk cells abolished. The so-called bactericidal power of fresh milk is also destroyed—a great loss from the point of view of infant-feeding.

Clinical opinion, specially on the continent, is steadily coming to the view that clean, fresh milk is better for infants than heated milk. Though infantile scurvy is rare, other disturbances—such as anæmia, constipation and pyelitis—are more frequently met with in children brought up entirely on sterilised milk.

With regard to the physiological effects of phosphorus Hart, McCallum and Fuller* report, that by keeping pigs on a ration containing very little phosphorus, calcium and phosphorus are abstracted from the bony skeleton in the proportions found in tri-calcium phosphate—the organism evidently possessing the power to recombine these elements into the organic forms of phosphorus needed in the nervous system and other parts of the body. Up to a certain weight, the animals receiving an insufficient supply of phosphorus thrive and gained in weight as well as did animals receiving abundance of the element. When this weight was reached, loss of weight began, followed by collapse. If the insufficient supply of phosphorus in the diet were supplemented by added phosphorus no bad results occurred, and this deficit could be supplied as well by inorganic phosphates like calcium phosphate, as by organic phosphates like phytin.

The phosphorus in the organs of animals on the low phosphorus ration was maintained at a constant proportion, comparable to that of normally fed pigs, but the percentage of ash in the skeleton of such pigs was reduced to nearly one half that of pigs receiving a normal ration or a phosphorus-poor ration supplemented by an inorganic phosphate.

SUCCESSFUL TRANSPLANTATION OF THE CORNEA

PLANGE (*Klin Monatsbl f Augenheilk*), a workman who had lost the sight of his left eye a long time ago, from an injury, had his right eye burnt with lime. Symblepharon, entropion, and ulceration of the cornea with prolapse of the iris, supervened. Thus he was completely blind and the condition of the eye seemed as unfavourable as possible for corneal transplantation. On the other hand, the surgeon

* *American Journal of Physiology* (Extract, *Journal American Medical Association*)

was free to make use of the tissues of the left eye

Preliminary operations were directed against the symblepharon and entropion. The conjunctiva of the left eye furnished the necessary material for grafting. Layer after layer of scar tissue was removed and the cornea thinned as much as possible without opening the anterior chamber.

Then a flap was dissected out of the left cornea, transferred to the right and fixed in position with four sutures. The basal layer on which the corneal graft rested was opaque and richly vascularized during the first twelve days after the operation. Then it lost its vessels and became transparent. In the end the patient counted figures at 4 and 5 metres. The left cornea healed quickly, as here also care had been taken not to open the anterior chamber — (*The Medical Review*)

SALT FREE DIET

It is only of late that the importance of estimating the "chloride balance" has been understood. Widal taught us that chloride of sodium controls osmosis within the economy. When the salt is retained in excess the specific gravity of the blood is increased, and less water is excreted by the skin, lungs, and kidneys. When this retention passes a certain limit dropsy sets in or increases. Chloride retention—that is to say, the excretion of only part of the chlorides ingested—is an early symptom of nephritis, hence the necessity of methodical quantitative analysis of the urine. Remarkable results often follow reduction of the amount of salt in the food, or the adoption of a salt-free diet. Under these circumstances it is desirable to know what proportion of chlorides is present in various articles of food, and Castaigne gives the following list —

Raw meat contains 1 in 1,000 of chloride of sodium, but on boiling practically all of it passes into the water. An egg contains about four grains of salt. The dry, leguminous vegetables, potatoes, and grains less than 1 per 1,000. Rice less than 1 in 10,000. Of green vegetables, spinach and cauliflower are comparatively rich in salt, while fresh green peas, boiled carrots, French beans, leeks, and lettuce contain but little, and may be regarded as salt-free. Ordinary bread contains a high proportion of salt and must be specially prepared for this purpose. Fruit, sweets, puddings, creams, and cheese can be allowed. Milk contains about 15 per 1,000 — (*Practical Dietetics and Bacterio-Therapeutics*)

VACCINATION AGAINST CHOLERA

A RUSSIAN official circular emphasises the following points in the prophylactic vaccination against cholera —

1 Statistics show that prophylactic vaccination guarantees protection to a certain extent against cholera, but the vaccinated must be careful to observe general hygienic precautions.

2 Anticholera vaccination is harmless and causes only a brief reaction, such as slight swelling and tenderness of the wound, slight temperature, headache, etc.

3 Of the two methods of vaccination in use vaccination with living cultures, or with killed cultures the latter is to be preferred, as the public have more confidence in the technique.

4 During epidemics vaccination should be done with great care, to exclude those already infected, and those liable to be exposed to infection before immunity is realized. Immunity is not realized until the fifth or sixth day.

5 Vaccination must be repeated two or three times at intervals of from five to seven days, or, until after the signs of the reaction have vanished.

The first dose of from 0.5 to 1 c.c. can be increased to 2 to 3 c.c. on the repetition.

A pregnant woman should be given a small dose only. Acute febrile diseases and acute gastrointestinal catarrh contra-indicate the vaccination.

Great caution should be observed in case of debilitated, anemic persons — (*St. Petersburg Med. Wochenschrift* Ext. (*Journal American Medical Association*))

In the *Biochemical Journal* for July, Moore has an article on the relationship of dosage to body weight, in which he insists on the fact that mere weight should not be taken into account so much as *body-surface*. Thus, if we have an animal of 1 kilo, whose dose of a certain drug has been determined, it will not do to take the weight of a man of 64 kilos into account and fix his dose of the drug at 64 times, the ascertained amount for the animal, as is so often done. What should be done is to take the relationship between the body-surfaces of the animal and the man, and this will be found to be approximately the $\frac{2}{3}$ power of the weight of the man as compared with that of the animal, i.e., the man of 64 kilos will require $64^{\frac{2}{3}} = 16$ times the quantity required for the animal of 1 kilo weight.

We would call attention to a most excellent little booklet just published on *Invalid Cookery*,* which we know meets a much-felt want. In India it is of the utmost importance that the doctor's orders regarding diet should be carried out as directed and not left to the sweet will of native servants. With the knowledge obtained from this little book those responsible for the care of the sick can easily make certain that the food given is, at least, palatable and prepared from the best materials. No household should be without a copy of a book of this type.

LITERARY NOTES

MEESRS BAILLIERE, TINDALL & COX announce, that on and after the 1st of July they will take over the

* *Invalid Cookery*—A Handbook of Cookery for the Sick room. By Miss Pearson and Mrs. Byde Messis Thacker, Spink & Co., Calcutta, 1909.

publication of all the books by Sir William Whitla, including *Materia Medica, Practice of Medicine*, and his well known *Dictionary of Treatment*, a new edition of which will be issued in the autumn. They will also in future publish Green's *Pathology and Morbid Anatomy*, a tenth edition of which is now in circulation.

These changes are the result of the retirement from business, after more than 40 years' work, of Mr William Renshaw, the head of the old established firm of Henry Renshaw, which will now cease to exist. They have also the following new works and new editions in active preparation—Dieulafoy's *Text book of Medicine* translated by V E Collins, M D, Lond; *Manual of Massage* by M A Ellison, L O S, 3rd edition; *Practical Microscopy* by F Shillington Scales, F R M S, second edition; *Aids to Analysis of Food and Drugs* by C G Moore, F I C, and W Partridge, F I C, second edition; *Sanatorium Treatment of Tuberculosis* by F R Walters, M D; *Surgical Anesthesia* by Bellamy Gardner, M R C S; *Aid to Mathematics of Hygiene* by R Bruce Ferguson, M D, third edition; *Chemical Notes and Equations* by G H Gammell, F I C, second edition; *Gynaecological Therapeutics* by S J Aarons, M D; *Incidence of Sex and Age on Disease* by J Grant Andrew, F R P S; *Menstruation and its Disorders* by Arthur E Giliss, M D, second edition. Also reprint of the second edition of *Minor Maladies* by Leonard Williams, M D.

MR H K LEWIS has purchased the remainder of the stock of the New Sydenham Society's publications, comprising the collection of volumes on medicine and surgery, the *Pathological Atlas*, the *Lexicon of Medical Terms*, and the *Atlas of Clinical Medicine, Surgery and Pathology*, issued by the Society during the years 1859-1907. Many of the works were of a pioneer character when issued by this Society, and have since acquired a classic and historic importance. The number of copies of each book has been of necessity limited on account of the heavy expenses of warehousing a larger stock, and of many of the volumes only a small number remained over.

SOME USEFUL SURGICAL APPLIANCES

By E A R NEWMAN,
MAJOR, I M S

PERSONAL experience of the difficulty of ascertaining from catalogues what will best meet the needs of comparatively poor mofussil hospitals has induced me to write these scattered notes, in the hope that they may be of some help to medical officers away from the Presidency towns.

Oil stoves—A good heating apparatus lies at the root of successful asepsis, and while the merits of the "Primus" wickless stove are known to many, I believe it is not so generally known that they are made in a variety of patterns under different names, "Intensive" and "Hekla." The Duplex Primus Range No 512

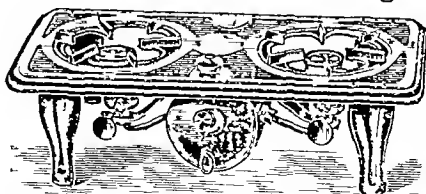


FIG 1

(Fig 1) seems particularly well adapted for operation room use. It is fitted with two large

Primus burners, both fed from a central oil tank. Each burner has a separate valve so that the flame of either one can be regulated or extinguished separately. The burners are wickless and burn kerosene on the usual Primus principle. The Range itself is substantially made of sheet steel. Length 20 in. Width 10 in. Height 6 in. Capacity of tank $3\frac{1}{2}$ pints. Price complete, 30s 6d. Silent burners, 1s 6d extra. The wholesale agents for these stoves are Messrs Moeller and Condip, 78, Fore Street, London, E C, from whom a complete catalogue of stoves can be obtained, which will be found invaluable for reference. It may be a useful tip to users of Primus stoves and prospective purchasers, to know that repair outfits, containing spare nipples, washers and a key, are obtainable for 1s 6d.

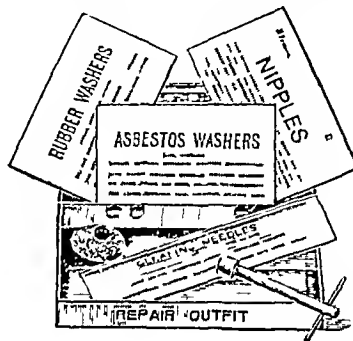


FIG 2

(Fig 2), with these at hand a stove can be kept in its pristine condition indefinitely. When ordering them the pattern No of the stove should be quoted.

The "Ideal" wickless spirit stove by the same firm is also well adapted for heating small instrument sterilizers.

Jars—Airtight and dustproof glass jars serve a variety of purposes. Two different patterns which, while thoroughly serviceable, are remarkably inexpensive, are the "Holborn" and the "Jules." The former are sold by the Holborn Surgical Company of Thames Inn, Holborn,



FIG 3

FIG 4

London. The flanged glass lid rests on a rubber band, and is made fast by a spring clamp (Figs 3 & 4). These jars are sold in seven different

sizes, capacity from 4 ounces to 4 pints, at prices varying from 9s to 21s per dozen

The Julesjai is primarily designed for domestic use for bottling fruit preserves, etc. The glass lid also rests upon a rubber band, but is fastened by a screwed metal cap. They are made in 20, 34 and 65 ounce sizes respectively, at a cost of 5s, 5s 6d and 8s per doz, with roughly 15% reduction per gross. Spare rubber rings, lids and caps are obtainable from 6d to 1s 6d per dozen. The glass is white but not very finished. These jars are admirably suited for keeping salts and other drugs in an airtight condition, and would be most serviceable for transporting *post-mortem* specimens for examination. If a somewhat rough appearance is not objected to, they are equally serviceable for storing aseptic dressings, ligatures, *et hoc genus omne*, in a dry or wet aseptic condition. A still cheaper kind have metal covers in place of glass.

Dressing sterilizers—A search for a strong high pressure dressing sterilizer revealed nothing better at the price than the Edinburgh pattern Schimmelbusch high pressure dressing sterilizer, manufactured for and sold by the Medical Supply Association, of Gray's Inn Road,

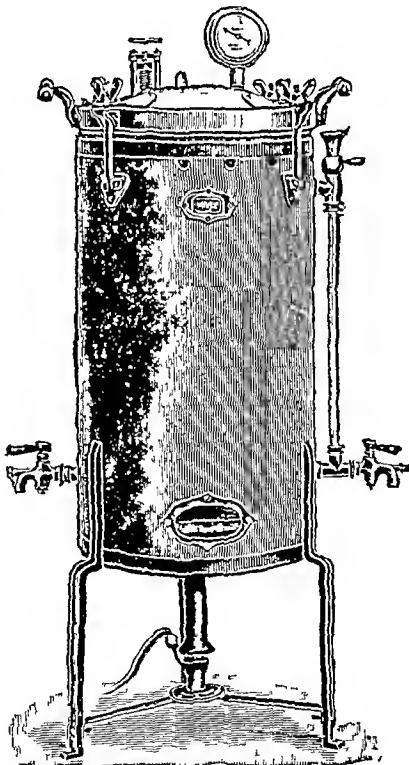


FIG 5

London (Fig 5). It is stoutly built of copper, of British workmanship throughout, and works at a pressure of 10 to 15 lbs per sq. inch. Height 37 in, cylinder outside 26 by 14 in, inside depth 20 in by 9½ in in diameter. Price, complete with 2 kettles each 8½ in in depth and diameter, £15. Kerosine stove £1 extra. With two more spare kettles, or better one large and two of half the depth, a very complete outfit is obtainable for

Rs 300 in round figures. It is as well to add in the specification when ordering, a spare glass water-gauge tube, and spare washers for it and the steam valve and also a spare spring for the latter. This will ensure its not being temporarily thrown out of use, for minor adjustments. There are cheaper patterns on the market, and also more expensive ones, but for value it meets the needs of *sach* hospitals as well as any I have seen.

If this outlay is beyond the resources of any hospital, experience has taught me that it is better not to get low pressure Schimmelbusch sterilizers of this pattern, at from one half to two-thirds the cost. Stack's low pressure sterilizer sold by Messrs Allen and Hanbury of London, is much handier and better adapted for daily use. It is made in two sizes, the smaller one measuring 9½ by 7½ in outside. Speaking from memory only, the price is 2½ and 4½ guineas respectively, without a stove. Spare cans are obtainable at 10s 6d. One or more of these will more than double its utility.

Suturing materials—The advantages of ordinary linen or flax thread over silk for suturing or ligaturing purposes will be confirmed by a trial of it. It is stronger, less bulky, far cheaper and obtainable almost anywhere. Many surgeons employ it now in preference to silk. Pagenstecker's celluloid-coated thread too will appeal to all who can afford it by reason of its strength and non-absorbent qualities.

Battiste rubber sheeting will be found to be a tremendous improvement on ordinary vulcanized rubber sheeting for almost all surgical purposes, and for many to which the latter is ill-adapted. It is far less bulky and lighter, and on this account easily sterilized by steaming or boiling, while it is equally durable and only half the price. The original Vienna make is stamped with the trade mark "Mosetig Battiste" and is obtainable from all instrument makers.

Michel's soft metal clips—As a substitute for skin sutures in accidental wounds, these are not a novelty but may be mentioned as a useful addition to the pocket case. Their supreme advantage appears to lie in their painlessness of application as compared with ordinary sutures. They require a special pattern of forceps for ease of application, and are instantaneously removable with a special pattern of parrot-beaked forceps, though these are not indispensable.

Peroxide of Hydrogen is an unimitating non-toxic antiseptic with the utility of which I have only too late become acquainted. Used in 10 volume strength its physical properties of loosening stiff and adherent dressings, and enabling them to be removed quickly and without pain, are very valuable. It is particularly useful in detaching inspissated concretions of wax in the ear. I venture to mention it in case it may be unknown to some.

Acetone is another chemical with whose virtues I was not acquainted until recently. It

is a remarkable solvent of fats, cellulose and rubber, at the same time it combines freely with water, in fact it is even more intensely hygroscopic than alcohol. Its chief value appears to lie in its use as a substitute for both ether and alcohol in preparing the skin for operation or puncture. Its cost, about 1s 6d per lb, is much the same as methylic ether, which it may replace in making collodion and ethereal soap, etc. It is equally volatile and inflammable.

Finally I may mention two articles which may be indirectly of use in surgery. The first is the R. I. P. soldering tool. Primarily intended for motorists, it will, I think, be found very handy as a self-contained portable blow-pipe and spirit lamp combined, to those who wish to manipulate glass tubing away from the advantages of a properly equipped laboratory. Price 3s 6d, from Leo Ripault & Co., Poland Street, Oxford Street, London. The second is a simple milk incubating apparatus designed and sold by Messrs. Martindale of London, the well-known chemists. Primarily intended for simplifying the process of "souring" milk, it would I fancy act equally well as a simple incubator for bacteriological purposes in the museum, as the source of heat is an ordinary candle night-light. Price 10s 6d. I may add that I have no interest in any of these appliances and make no apology for sordid details of cost, as this information is always of practical interest.

LONDON,
The 28th March 1909 }

A NEW URETHROSCOPE

SUGGESTED BY W. WYNDHAM POWELL, F.R.C.S.

THIS instrument has been designed by Mr. Wyndham Powell, after many attempts had been made to eliminate some of the imperfections of his earlier instrument. The chief objections to the old instrument were centred in the type of lamp used, and in the tedious method of focussing. In the new model these objections have been entirely overcome. A substantial lamp in screw cap has been adopted in place of the fragile lamp with copper wire terminals, and the focussing operation has been reduced to the turning of one screw.

When once the light is accurately focussed down the tube, the adjustment taking a few seconds only, the position is fixed and permanent, and cannot be altered except by design. Lamps can be replaced without refocussing once the instrument is adjusted.

The beam of light projected down the tube is parallel and of great brilliancy. It is obtained by using a new pattern lamp with specially arranged filaments, and a mirror pierced with a sight hole in line with the centre of the tube. The tube may be two feet long if desired, without the illumination at the end being

greatly diminished. The new instrument is greatly superior to the old one at all points. The light given by it is quite double the intensity of that given by the old one, and focussing is simple and accurate, and the new instrument is as mechanically strong as any other urethroscope. All weak points of the old instrument have been eradicated and a great improvement in the illuminating power effected.

The operating attachment, which has only been changed in minor details, can be used with greater facility than before, on account of the better illumination of the urethra capable of being obtained with the new instrument.

Reviews

The Cause and Cure of Consumption—By H. VALENTINE KNAGGS, M.R.C.S., L.R.C.P., L.S.A., F.R.C. London, Jarrold & Co., 1909. Price, 1s net.

THIS is the new Apocalypse of healing, and all for a shilling! "For all established cases of consumption the appearance of the fresh blood, under the microscope, is absolutely characteristic and diagnostic. The red cells move sluggishly and with difficulty, and are often massed together in clumps, while the fibrin will be found markedly in excess. The microbe of consumption can originate in one of two ways. It may originate from the fibrin granular deposits or may equally arise from the dead white (or pus) cells. A leucocyte is but an agglomeration or colony of bacilli, massed together and organised by the electro-magnetic power of 'attractive' into a living whole, functioning through the agency of its instinctive centre called the *nucleus* (sic). It is the microzyma that evolves the germ, and the germ that builds the cell. If, then, the tubercle bacillus is helping all the time to rid the body of solid waste matter which cannot be eliminated by any of the usual excreting channels, surely it must be a futile procedure to introduce serums and vaccines into the blood for the purpose of killing off this beneficent germ." These quotations will, we trust, whet the appetite of our readers, who will thus be induced to take their shilling's worth of Knaggs. Dodgson, in writing "Through the Looking-Glass," intended to add to the gaiety of nations. Knaggs, we believe, had no such intention. He has nevertheless succeeded admirably, so we wish him well, although why he should have allowed Collings to disfigure the page with fearful and wonderful drawings, we are at a loss to guess.

Immunity and Specific Therapy.—By W. D'ESTE EMMERY, M.D., B.Sc. (LOND.) With illustrations. London, H. K. Lewis, 1909. Price, 12s 6d net.

ALL who are interested in the problems of immunity, and who is not nowadays, should read

this handy volume, in which is given a fairly balanced account of the nature of toxins, the phenomena of anti-toxin formation, and the inter-reaction of toxin and anti-toxin. The "side-chain" theory is clearly set forth, as also the theories of other schools of serology, with reference to immunity to toxins, bacteriolysis, etc. The chapter on agglutinin is a very good one, as is that on phagocytosis. The interesting subject of reaction to injections of tuberculin, mallein and other substances is shortly but intelligibly dealt with. On the difficult subject of the colloidal theory of antibodies the author gives considerable help to the student, while the description of the processes by which the organism recovers from, or succumbs to, bacterial invasion is as good as anything we have read in much more pretentious works. Much information is given regarding opsonins—and incidentally the routine estimation of the opsonic index is deprecated. To Emery the leucocyte is the saviour of the organism; the polymorphous he believes to be the origin of complement, which is the alexin of older observers, and the "thermolabile opsonin" of some modern authorities—the "thermostable opsonin," he considers may be an agglutinin, but is more probably an amboceptor whose action is much more opsonic than bacteriolytic, in that in small quantity even it prepares the bacteria for the attack of the leucocytes, while a large quantity is necessary to prepare them for solution by the action of complement. The leucocytes absorb toxin, and it is more than probable that in the lymphoid tissues they neutralize the toxin by their anti-toxin. The action of anti-toxin he believes is not only to fix toxin but to prepare this for the attack of the leucocytes.

The practical application of the facts observed is set forth briefly in the section on specific therapy. As a whole the book is an excellent one, and should be widely read.

Diathesis and Ocular Disease—By A. MAITLAND RAMSAY, M.D., Ophthalmic Surgeon, Glasgow Royal Infirmary, &c. London: Ballière, Tindall & Cox, 1909. Crown 8vo, pp. viii—184, 17 plates. Price, 3s 6d net.

THIS little volume contains the post-graduate lectures delivered at the Glasgow Ophthalmic Institution in September 1908, and is published at the request of some of those who were present. This explains the fact that much more is discussed than the relationship between diathesis and ocular disease. Under Glaucoma, for instance, the whole of its pathology, symptoms and treatment are discussed. Nevertheless the book is a very interesting one and draws attention to an aspect of disease which is far too much neglected, and by no one more than by the Specialist. The necessity of treating patients, not diseases, is too often lost sight of. As the author well puts it—"Too much attention is being paid to the germ, and far too little to the soil

on which it falls," and he points out that the results obtained from the study of bacteriology are favourable, rather than antagonistic to the old doctrine of diathesis. He describes the neurotic, the scrofulous and the arthritic diathesis, agreeing with Sir Dyce Duckworth that scrofula is in no sense tubercle. Having discussed the type of each diathesis, Dr Ramsay goes on to discuss conjunctivitis and scleritis, iritis and choroiditis, inflammation of the retina and optic nerve, toxic amblyopia and retrobulbar neuritis, and finally glaucoma giving a clear clinical account of these diseases, and their treatment, especially from the point of view of diathesis. The book is well illustrated and will well repay perusal, not only by the ophthalmic surgeon but by the general practitioner.

Persian self-taught—By SHAYK HASAN. Mail borough's Self taught Series. London, E. Mail borough & Co. Price, 2s, cloth, 2s 6d.

WE have read this little manual with interest, but, from a fair acquaintance with the problems presented to the student when he attempts to learn a foreign language, we doubt whether the time spent on studying Persian after this "self-taught" fashion is worthily employed. When the Shah-in-Shah visited Germany many years ago, a Professor of Persian addressed him in a flowery speech. The Shah, turning to one of his suite, who was acting as Interpreter, enquired what language the learned man was using. The student of Shayk Hasan's book might possibly find himself in the same galley as the German Professor. For the phonetic pronunciation does not represent the true Farsi pronunciation. It does not even represent the bastard-pronunciation affected in some parts of the Indian Empire.

A Manual of Minor Surgery and Bandaging—By BILTON POLLARD, F.R.C.S., Surgeon to University College Hospital and Professor of Clinical Surgery, Member of the Court of Examiners of the Royal College of Surgeons. Fourteenth Edition, Enlarged and Revised. Publishers Messrs J and A Churchill, London, 1909. Price, 7s 6d net.

THIS work is too well known to need any introduction. This edition brings the book thoroughly up to date, and as the author states in his preface, every attempt has been made to elucidate the principles of aseptic surgery, and to lay stress on its practical details. The book is invaluable to house-surgeons, and dressers in the wards will find in it just those details of practical surgery which cannot be applied anywhere so well as in the wards of a hospital. Junior practitioners—particularly those who have not had the advantages of a training as a house-surgeon—will find much in the book that will help them in practice. The new illustration, which appears as the frontispiece, shews the present-day conception of a surgeon's

aseptic costume Though much good surgery can be done, and is done daily, under much less rigid conditions, we are reminded forcibly by this illustration of the responsibilities of an operating surgeon towards his patients

Diseases of the Digestive Canal—By DR PAUL COHNHEIM Translated from the Second German Edition by Dudley Fulton, M.D., illustrated Messrs J. B. Lippincott Co. Illustrated Pp 373 1909

THIS volume is a succinct record of the author's every-day experience and frankly makes no attempt to review the literature, or to compile the views of others or to present any pathological details and theoretical discussions. Every subject is attacked with directness and all non-essentials are ignored. The most distinctive feature of the book is the discussion of the subject-matter purely from a clinical point of view. Although it cannot entirely replace the larger text-book on the subject with which it deals, the sound practical hints and clinical data will be found most trustworthy. We consider the volume a marked addition to the literature of the subject, and that it will be found of peculiar value to the general practitioner in the diagnosis and treatment of gastro-intestinal disorders.

The Races of Indian Rats—Records of the Indian Museum, Vol III, Part I, May

CAPTAIN LLOYD'S survey of the Rats of India, which forms the May number of the Records of the Indian Museum, constitutes one of the most important and interesting bits of zoological work that has yet been published in India. What makes it almost unique in the annals of zoology and gives such weight to its far-reaching conclusions is the fact that it is based on the examination of a series of nearly ten thousand specimens. It casts a flood of light on the value, stability and mode of origin of the variations that have in the past been made specific, that have led to the establishment of new species particularly in the genus *Mus*. He shews that whenever a large series is examined from any particular place, a great range of variation is found in size and colour and that these variations tend to arise independently in the most widely separated places, places so far apart as Freemantle and Cawnpore. In fact, he establishes that rats are in what according to De Vries is known of as a state of fluctuation, so much so that every little group, the rats of every particular house almost, show their own little variations marking them off from their neighbours, just as is found in human family groups. The point that is so damaging to the present system of nomenclature and the current fashion of unlimited manufacture of species is that he has demonstrated that the present systematists are working far within the margin of error: the difference between species is infinitely less than the ordinary variation to be found in any large series of one species.

Whereas a few years ago some 90 names were included in the Indian genus *Mus*, Captain Lloyd finds there are only 4 forms sufficiently distinct from *Mus rattus* to warrant specific names. *M. vicereis*, the white-bellied short tailed rats of Cashmere, *M. nitidus*, the hill rat of Darjeeling, *M. blanfordi* of the Nilgiri Hills, and *M. jerdoni*, a small Himalayan rat with characteristic palate ridges. It is to be regretted that from a plague point of view the survey does not add much to our knowledge, apparently any house rat can convey plague.

Lectures to Practising Midwives—By VICTORIA BIVNETT Publishers Baillière, Tindall and Cox Demy 8vo, pp 14 and 256 Illustrations 41 Price, 4s

THE writer of this little book has succeeded to a remarkable extent in the very difficult task of explaining a technical subject in language which is of necessity of a largely non-technical nature, indeed in the few cases where an explanation or description is not in our opinion quite sufficiently clear, it is not from any inability to express what is desired but rather from excessive condensation. Although the book is primarily addressed to those who are controlled by the English Midwives Act, its principles are applicable to midwives everywhere, and it will be found equally useful to midwives and to those who have to train them. It tells the midwife plainly when it is necessary for her to call in a doctor, but at the same time it gives her instructions as to what she should do in the event of the doctor being inaccessible or his advent being delayed.

The importance of asepsis, and the dangers of sepsis are accentuated partly by considering puerperal sepsis and antiseptics in a chapter which takes precedence even of that on pregnancy and the examination of the pregnant woman, and partly by repeated references throughout the book to examination by an aseptic finger or manipulation by an aseptic hand. There is an obvious slip on page 19 where the axis of the outlet of the pelvis is described as directed upwards and forwards, but the rest of the book is full of accurate and simply expressed information. The illustrations are borrowed from Galabin's and Jellett's books and are well printed.

Practical Medicine, Series 1908—Vol 1, GENERAL MEDICINE Published by the Chicago Year Book Publishers Send for Review by G. Gilhes & Co, Glasgow

THIS series is under the general editorial charge of Gustavus P. Head, M.D., the volume under review being edited by Frank Billings, M.S., M.D., and J. H. Sahsbury, A.M., M.D. These volumes always afford useful reading and that under review forms no exception to this rule. It opens with tuberculosis, and with regard to the pulmonary form the papers abstracted show

that there is an evident disposition at the present day to look upon this as a secondary extension along the lymphatics and across the obliterated pleural cavity to the apex of the lung from a primary bacillary infection of the tonsil or oesophagus. Tuberculin both in diagnosis and treatment has during the year inspired several papers, and minute attention has been directed to all the factors on which successful treatment depends. Of the other diseases of the lungs pneumonia fills the largest space.

Diseases of the heart occupy a large section of the book, among the most important papers being one by Keith and Flack on the auriculo-ventricular bundle, and others on the Adams-Stokes syndrome. Hypertension has been illumined among others by Elliott in America, and by Oliver and Adams in England.

For the rest the most valuable papers reviewed are upon influenza, many of these appearing in a single number of the 'practitioner,' on exophthalmic goitre which appears to have attracted attention chiefly in England and in America, on Addison's disease and on diabetes.

The book contains two misprints, fig 18 is inserted upside-down, and the formula of Mist Sodæ c. Æther Chlor. of the Brompton pharmacopœia is incorrect. Neither is of much moment. The volume gives an excellent selection from papers published during the year, and fully maintains the usual high standard of the series.

Correspondence

"QUININE BIHYDROCHLORIDE V QUININE BISULPHATE"

To the Editor of "THE INDIAN MEDICAL GAZETTE"

DEAR SIR,—I am afraid, I am introducing a well worn subject, but as I am not satisfied in my own mind about the matter, I trust that you will publish this letter in the hope that it may raise a correspondence which may prove instructive to me.

I have always been in the habit of injecting the Bihydrochloride of Quinine in severe cases of Malaria. Lately I have come across a medical man who avers that it is a useless salt of Quinine and that the only salt of any use for injection is the Bisulphate of Quinine.

Now, from what I can remember of the Physiology of the Blood I should have thought that the Bisulphate was a much more foreign salt to the plasma than the Bihydrochloride. As far as I can remember the plasma contains Chlorides in abundance, but Sulphates are conspicuous by their absence. Also, judging from Capt McCay's work, I should have thought that the sulphates of Quinine on being injected would be transformed into the chlorides, Sodium Sulphate being formed in the interchange which would speedily be eliminated. If this is the case then surely it would be better to start with the Chloride salt straight away. My informant also stated that absorption was much greater when the salt was injected subcutaneously than when injected intramuscularly. But surely change and interchange in the blood is much greater in muscular tissue than in connective tissue.

Trusting that the two points raised in my letter about which I should like trustworthy information will be the means of bringing into correspondence the "verba magistri."

GOVERNMENT HOUSE,
OOTACAMUND
The 10th June, 1909

I remain,
Dear Sir
Yours faithfully,
T HAY BURGESS, M.B., F.R.C.S.,
CAPT., I.M.S.

"BLACKWATER FEVER AND QUININE"

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—With reference to Capt McCay's researches into the action of sulphates and chlorides on the blood and his practical deductions therefrom for the prevention of blackwater fever, I think the following notes may be of interest.

In March, 1907, I was called to see a patient suffering from blackwater fever. He was an old planter and gave the usual history of having had a lot of low fever not properly treated, and the previous night had taken ten grains of Quinine Sulph. He had a very bad attack but recovered. No quinine was used until after the urine was clear and then only $\frac{1}{2}$ grain tonic doses of Quinine Sulph. He then returned to Burma and suffered again from malaria, which was treated by hypodermic injections of 5 grain doses of the bihydrochloride.

Since then he has been quite well until the 10th May when he had another good ague which was treated by Quinine hydrochlor. grs x tds for two days and moderate doses continued for a week. He had no more than one day's fever and left off taking his quinine after a week.

On May 26th he felt "achey" in the morning, but passed perfectly normal looking urine. He came in from work feeling feverish, and took ten grains of Quinine Hydrochlor. and went to bed about 11 A.M., at 11.15 he passed clear urine. He then had a slight rigor, and at 1.30 P.M. his temp was 101.4. He was given aspirin grs x and almost immediately afterwards (before the aspirin could have been absorbed) he passed very dark colored urine. I saw him at 7.30 that evening and he was then sweating profusely—temp 102.6, pain in epigastrium and over the liver, urine a deep claret colour. I gave him grs x of calomel, and hourly doses of Liq. Hyd. Perchlor. 3 grs and Sod. bicarb. grs x. At 7 A.M. next morning his urine was clear but contained a trace of albumin. No quinine was given. At 10.15 A.M. his temp was 99.8 and he passed reddish muddy coloured urine. By the evening this had cleared up and next morning the 28th, there was not even a trace of albumin. For the following three days he had slight rises of temperature, but the urine remained normal and he is now quite well.

This patient has therefore had Hemoglobinuria after grs x Quin Sulph. and also after grs x Quin Hydrochlor., but a much milder attack, and has twice had fever without Hemoglobinuria once treated by bihydrochloride hypodermically and once by the hydrochloride by mouth.

BISANATH MEDICAL OFFICE

PAUTA PUKHURIP,

MIZOJAN P. O.,

BISHNATH

Assam, 6th June, 1909

I am
Yours faithfully
F C MCCOMBIE M.B.,
LONDON

"CASE FOR DIAGNOSIS"

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—I should be glad of an opinion through your paper on the following case. A Hindu girl, aet 20, became unconscious from charcoal fumes, just after her confinement, and received a burn of the third degree, and about 12 by 6 inches in size. It was dressed with cow dung and ashes as is the custom here. Four weeks later she was brought to the Hospital, suffering from fever and anaemia, the dressing having remained unchanged since it was first applied. Tm 98 to 101 P 84 to 96 R 15 to 20 Urine Sp G 1015 normal quantity, no alb. S x days later, the general condition had much improved, the patient ate well, slept well, p 70 to 80 and of good quality, wound clean with healing edges. On the next day the dressing was done at 9.30 A.M., and her condition was as usual causing no anxiety. After the dressing the patient's bed was taken out into the court yard by her relations. Ten minutes later she was found unconscious, and she died the same night without recovering consciousness. Is it possible that death can have been due to the burn? Condition at 10 A.M., pt unconscious, corneal reflex almost absent. Pupils equal, neither dilated nor contracted. T normal, R 20 shallow, regular. P 62 good volume regular. Some white fluid, apparently milk, was running out of her mouth, and the muscles of her face were twitching. Poisoning was suspected, it is not uncommon here, especially when a girl is likely to be sick for some time. The stomach tube was applied, and the washings kept for examination. Vomiting began one hour later, then spasms of the muscles, especially of the arms which were repeatedly raised above the head. There was no paralysis, and no diarrhoea. After 4 P.M., the pulse began to fail, becoming faster and weaker by 9 P.M., it was imperceptible, and the patient expired at 11.30 P.M.

The case was taken up by the police and a post mortem examination was made. Nothing was found abnormal in the brain, lungs, heart or kidneys. The liver and spleen were slightly congested. At the pyloric end of the stomach there were numerous small patches of congestion and of hemorrhage and a few also in the first two inches of the

duodenum Glands appeared normal, Solar plexus not examined

Chemical Examination—The wall of the stomach, the first washings from the stomach and the spoon and cup belonging to the patient were all found to contain a 'Resinous matter resembling Mudra Juice' but it was not found in the milk which had been in the cup. Mudra is known as Indian ipecacuanha, and is commonly used for infants and to poison cattle.

No exact description of its poisonous action can be found. The case was dismissed on the ground that the symptoms and the post mort findings were consistent with those of 'Sudden death from burn' which opinion was given by a medical man called from another town by the defence. I should be glad of further opinion on the question, consideration being had to the facts, that over 5 weeks had elapsed since the burn was received, that the area was not more than 12 by 6 inches, and that the patient's condition on the morning of the day of her death was good, and that the pulse remained good both as to rate and quality till 6 hours after she had become unconscious.

I should also be glad if any member of the profession could give any description of the symptom of poisoning by Mudra juice.

June 5th, 1909 }

I am, Yours faithfully,

M D

"LANOLINE OR GLYCERINE"

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—From newspaper reports of the Indian Medical Congress at Bombay, I find that in the discussion which followed Lieutenant-Colonel Hutchinson's paper on vaccine, whilst it was granted that lanoline will preserve the vitality of vaccine longer than glycerine, it was contended, in reply to Colonel Little's able advocacy of the former medium that it unfortunately possessed no bactericidal power. I would invite the attention of those interested in this subject to results of a series of careful experiments conducted by Dr Sreenivasa Rao, Bacteriologist to the Mysore Government, as reported by me in the Journal of State Medicine (now the Journal of Royal Institute of Public Health) for December 1901. He showed, definitely, that in stored lanoline vaccine extraneous organisms steadily decreased with lapse of time—the action, however, being slower than in the case of glycerine. The general assumption that lanoline is incapable of dealing with extraneous organisms is largely due to Dr Mouclton Copeman's summary dismissal of the matter in his work on vaccination. Yet, this authority stated at the Budapest International Medical Congress that, as a result of his own experiments, he found both lanoline and glycerine were inimical to extraneous organisms. Previous to this, Gottstein had shown that anhydrous lanoline had the peculiar property of resisting penetration by organisms introduced on its surface, and it was this peculiar quality of lanoline which first directed my attention to the possibility of its being suitable for the preservation of vaccine. This observation of Gottstein's was confirmed by direct experiments by Dr Sreenivasa Rao. It is a property of obvious value. Dr Copeman apparently has never explained how he came to alter his views, and it can only be supposed that he has taken for granted the results of Dr Green's experiments. I am aware of experiments by an officer in India which would go to show that lanoline does not possess the power I have claimed for it, but the result was incomplete owing to some what irregular results at different stages of the experiment.

It seems to me the contradictory opinions above referred to are susceptible of explanation, in some part, as a result of the grades of carefulness by authorities concerned in estimating the size of loops of this tenacious material, as employed for individual bacteriological experiments, but that the most readily recognizable factor is that the anhydrous lanoline as placed by a certain well known firm on the English and Indian market is liable to be variable in quality and, at times, inimical to preservation, and in any case is not the material with which I conducted my original experiments and upon which I would pin my faith as to duration of vitality of vaccine preserved with it. *Anhydrous lanoline employed for preservation of vaccine should be the neutral product, free of glycerine fats, strictly obtained by the process of manufacture first ecogulated by Liebreich.* It gives results incomparably better than those obtainable with the material exported to this country in tins for use as ointments. This correct material can be obtained by paying a price somewhat above that demanded for anhydrous lanoline as found in the market from Messrs Benno Jaffe Martinkinfelde, Berlin, or through Messrs Burrough and Wellcome by special order. But before dismissing this subject, I would ask whether the matter of extraneous organisms in vaccine has not attained an exaggerated value in the esteem of the profession. The experiments made at home by Dr Green and others serve splendidly to calm the ravings of anti-vaccinists, as to possible injury and death of the subject of vaccination by organisms other than the undefined representa-

tion of cow pox. The position, however, is very much like that of those who would maintain in days when asepticism is followed, that the use of the carbolic spray is necessary. If Vaccine Institutes are constructed and are conducted, in all details, with a knowledge of modern asepticism, wherein lies the peril of extraneous organisms—especially when, in practice, it is found that actually sterile and yet active vaccine is a myth? If Dr Sreenivasa Rao's experiments be admitted, it follows that whilst both lanoline and glycerine are capable of killing extraneous organisms, glycerine kills them quickly, and lanoline kills them slowly, whilst the duration of vitality of the vaccine would seem to have a relation to this fact. Again, presuming that glycerized vaccine were brought to the arm of the subject sterile, at the best, so far as the break of continuity of skin is concerned, the actual diminution of contact of extraneous organisms is small in comparison with the total number now appearing on the scene. On this point Captain Christophers, I.M.S., as Superintendent of the "King Institute," kindly conducted experiments for me with sterilized glycerine and water representing the dilution for preservation of vaccine. Subjects' arms were carefully cleansed and prepared by him as if for vaccination all instruments and material employed being sterilized. The skin supplied sufficient organisms under these conditions to give the following results—

"Colonies from a loopful of sterile glycerine and water 50 per cent after performing a mock operation of vaccination with this fluid—"

CASE 1	3,528 Colonies	Various but mainly staphylococcus albus
CASE 2	840 Colonies	Nearly all staphylococcus albus
CASE 3	21,500 Colonies	Mostly too minute for diagnosis large colonies are mostly staphylococcus albus
CASE 4	1,848 Colonies	Large colonies chiefly staphylococcus citreus 3 colonies of staphylococcus aureus present
CASE 5	32 Colonies	A large spreading colony has obliterated much of plate
CASE 6	1 660 Colonies	Mostly staphylococcus albus

Although I grant a diminution of extraneous organisms as represented by a sterile vaccine may, in respect to numbers be of some advantage, surely this experiment shows that the killing of these is not of the transcendental importance usually held. In short, whilst this quality of killing extraneous organisms may appeal to the fancy of anti-vaccinists in England, cultivation of vaccine, so that it may attain its best characteristics under conditions that will ensure asepticism in all details, and its subsequent preservation by any medium that will secure, in the tropics, and without artificial cold, the best duration of vitality, under ordinary conditions of service by Indian Vaccinators, are the points which seem to me those which should be held as of the first importance in India.

INSEIN, BURMA, }
30th March 1909 }

Yours, &c,
W G KING,
COL, I.M.S

SURVIVORS OF THE PUNJAB CAMPAIGNS"

To the Editor of "THE INDIAN MEDICAL GAZETTE"

DEAR SIR,—In a short obituary notice of Surgeon General G H Ray among the "Service Notes" on pages 78 79 of the issue of the Gazette" for February 1909, reference is made to the services of the survivors of the Sutlej and Punjab Campaigns, from which one would infer that Surgeon Major W F MacTier took part in the former but not in the latter.

As I thought this was incorrect I communicated with Surgeon Major MacTier who has lived for many years at St Andrews, N B, and have just heard from him that he served throughout both Campaigns, being present at the actions of Ramnagar, Sandilapuri, and Chillianwallah in the Punjab Campaign of '48 '49, as well as in the earlier Sutlej Campaign.

I thought this information might interest the compilers of the notes, who in some future issue of the "Gazette" might point out that there are still living two Indian medical officers survivors of both the Sikh Wars, viz., Surgeons Major Hinton and MacTier. I may add that the latter also served on the Headquarters Staff with the force before Delhi on the Ridge, throughout the hot weather of '57.

He is still a hale old gentleman who over his pipe and a glass of grog will relate many stories of service in the good old days of "John Company."

54, PARLIAMENT STREET,
LONDON, S W,
31st March 1909

Yours, etc,
C N C WIMBERLEY,
MAJOR, I.M.S

BERI BERI

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—In an interesting Editorial in your May number you review a paper by Drs Fraser and Stanton (in the *Lancet*) giving the results of an investigation on the causation of Beri beri which was carried out in this District. Those results were summed up by the authors of the report as showing that "*Beri beri has, if not its origin in, at least an intimate relationship with the consumption of white rice*"—not, observe, particularly with Burma rice. It is not with this peculiarly stunted presentation of the really fine demonstration of the truth that the experiment yielded that I wish now to deal. But your reviewer seems rather to have emphasised the supposition the Beri beri was held by investigators here to be due to the consumption of Burma rice as distinguished from all other sorts. This is by no means the case. Beri beri is believed (by those who have made themselves sufficiently acquainted with the facts) to be due, not to the consumption of rice of a particular derivation in any state, but to its use in a particular state, which may pertain to rice of any derivation.

General evidence (first brought together by the present writer) has proved beyond all possibility of doubt that Beri beri, as it occurs in this country at least, is not merely confined to rice eaters, but that among rice eaters it attacks only those who eat rice in a certain state, namely, when it has removed from it the whole of its perisperm, and has there after become stale.

Rice from which the greater part or even the whole of its perisperm has been removed when eaten *fresh*—prepared dry by dry as it is by natives growing and using it for their staple all over the world—Burma, India, Malaya, Madagascar, Anam and Siam—*rice when thus eaten fresh*, however much decocted, never produces Beri beri. The toxic quality depends, therefore, clearly not on the mere absence of perisperm but on some added effect, some later change which the grain undergoes after its decoction.

Another fact—of a practical value which cannot be over estimated—is that this change, whatever it is, which happens in decocted stale rice, rendering it poisonous can be and is, in the practice of certain places, easily prevented. It appears that if the raw grain be soaked, and then boiled and dried before decoction the rice prepared from such grain never afterwards becomes toxic in the sense of producing Beri beri, however stale and mouldy and unfit for food in other respects it may be. Rice so prepared retains the whole of the perisperm (and is therefore fit for mice nutritious) but for the reason given above it can hardly be to the preservation of this layer that the destruction of its potentialities for becoming poisonous later on is due. To rice so made the present writer has given the epithet of "cured," and this stands as evidence of the value of the curing the incontrovertible fact, that in the Malay Peninsula hundreds of thousands of immigrants of a race which has in all other respects proved more sickly than all other sections of the population, namely the Tamils, who as a class use only cured rice, year after year, although everywhere in contact with Beri beri, have remained entirely exempt from the disorder.

Cured rice was for this reason adopted by the local Government for use in all their institutions, instead of the ordinary white uncured sorts. The result was that Beri beri became at once and completely stamped out from the prisons, the asylums and the hospitals, in which its occurrence was formerly a scourge. Not only so but in the hospitals where cured rice was adopted the mortality among Beri Beri cases admitted as such, also in every instance immediately fell—in some instances from as much as forty five per cent (an appalling rate) to 10 per cent or under, while in hospitals where it was not adopted severe mortality continued.

To the question you ask as to the condition of the Burma rice used in the investigation which Fraser and Stanton report, the answer is, that the rice was to all appearance clean and dry and sound and in good order.

Your observation that thousands who use similar Burma rice (in Burma and elsewhere) enjoy complete immunity from Beri beri—a very old objection to the rice theory—is easily explained. Either these natives eat their rice *fresh* (or nearly so) or they combine with the rice component of their diets such a proportion of other elements meat, fat vegetables (especially pulse) as protects them from the toxic action of the rice. For neither (it may be reasonably supposed) is stale uncured rice at all places and all times equally poisonous, nor is it any corollary of the rice theory of Beri beri that every one who eats rice in moderate quantity must necessarily get the disease. The toxic action is only manifested probably when the rice is eaten in excess and when it is so eaten it is likely, no addition of other articles will entirely mask its effects.

I may add that the investigation of which Drs Fraser and Stanton detailed in the *Lancet*, the results which you review, was originally an experiment instituted by the local Government in response to an application by myself. As you are

aware, but a few years ago no single authority on Tropical Diseases supported the "rice theory." Belz and Scheube, Takaki and Sneyosin, Pokelhaing, Van der Burg, Vorderman, Eijkman, Grijns, all the French authors, and last but not least Manson had rejected it. Sir P. Manson had indeed emphatically declared (at the meeting of the B M A in 1902) that it had been proved up to the hilt "that between Beri beri and food of any kind there was no connection. My local colleagues here one and all were unbelievers. Some of them, Travers and Ellis, recorded observations which they believed entirely disposed of the theory. The two first Directors of the Local Institute of Medical Research, Dr Hamilton Wright, and Dr C W Daniels, in particular poured upon it the virils of their scorn.

But the irrepressibility of truth was justified, and a mass of evidence which I was enabled to place before Government in a paper compiled in 1903 showed that in rice,—in stale uncured rice—alone lay the cause of Beri beri.

My submissions impressed the Government and led them with wise liberality to accede to an application which I made (in which I received the support of Sir P. Manson) to be granted an opportunity to demonstrate the truth of my views by direct experiment independently controlled. The outcome was the investigation upon which Drs Fraser and Stanton have issued a Report. In its inception and origin, in the initial arrangements and design, the experiment—the investigation—was mine, and I personally shared in the labour of the actual observation made. The opportunity to carry out on a large body of labourers observations both troublesome and detailed and often repeated, and so necessarily productive of derangement in their work was only with difficulty found. Had it not been that a personal friend of the writer's was himself, as an enlightened and interested employer, full of enthusiasm for the unravelling of the mystery of Beri beri, the chance for such a direct and carefully controlled experiment might never have been gained. That employer was Mr T R Hubback (of Big Game shooting fame) and to him we due the thanks of all interested in research into tropical maladies for ungrudging and valuable aid in this particular enquiry. Drs Fraser and Stanton were appointed by Government to control the work and results. Although, after Mr Hubback who furnished the material and the Government who financed it at very considerable cost, it was to the present writer that the investigation was due, and although I had the pleasure of collaborating with Drs Fraser and Stanton in the actual work done these authors in their publication have so sedulously refrained from mention of these facts that it might be inferred by any reader of their paper that they alone were responsible for the results achieved. As this is an impression which no doubt they would be the last to desire should be encouraged I have taken this opportunity to correct it. In his austere scientific zeal, no doubt, your trained researcher is apt to forget these little acknowledgments.

I am, Sir,

Your obedient servant,

W LEONARD BRADDON

SFREMBAN,

June 25th, 1909

ABSCESS OF THE LUNG IN A FETUS

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—The dead body of a fetus was sent by the Police on Sunday, 13th June, at the Sassoon Hospital, Poona, with a Panchnam accompanying it stating that the body was found on the Railway line near Ghorpuri covered with a piece of duty cloth and that it appeared to be premature of about 7 months' intrauterine life, but as the cause of death was not known, it was sent for examination.

On external examination it was found to be 13" long, 1 lb 12 ozs in weight. Hair marked on the head, nails were present both on the hands and feet. Decomposition had commenced. The skin was green all over. No bullæ or rigor mortis present. The cord and placenta were absent. On opening the thoracic cavity and removing the lungs with the heart, lungs and trachea the lungs were found to be in a state of commencing decomposition, being covered over with small but distinctly marked putrefactive blebs. They were dark red in colour and the right lung presented three abscesses, one in its upper lobe about the size of a flat four anna piece and the two others somewhat smaller in the middle lobe. The left lung had two other abscesses both in the upper lobes of the size of a berry each. On cutting into them thin pus was let out from all of them. On the application of the hydrostatic test both lungs with the heart attached were at first found to float and each lung behaved similarly. On making several small pieces from the lungs on other side, the pieces were found to float still but with difficulty and after pressing them between two pieces of board in the usual way they sank in water at once. From the test it was evident that the fetus

could not have been born alive the floating of the lungs at first being due to putrefaction changes and formation of blebs on the surface. The liver, spleen and other organs were apparently normal. Stomach was empty and the large intestines contained meconium, some of which was seen also round the anal orifice.

Remarks—This is an interesting case and deserves to be recorded inasmuch as abscesses in the lungs of a newly born infant are very rare, and even in the case of adults this condition is not very frequently met with. The fetus was premature but from the very meagre and unauthentic history available, it is difficult to state if the premature birth was due to maternal or foetal causes. It is possible the mother was suffering from tubercle or syphilis (probably the former) which disease had extended to the fetus causing the abscesses and also determining the premature delivery.

POONA, }
14th June 1907 }

E S BHARUCHA, I M S,
Assistant Surgeon,
David Sassoon Hospital, Poona

SPECIAL ARTICLE

ON SOME OLD EIGHTEENTH CENTURY LISTS OF THE I M S

B D G CRAWFORD, M B, I M S,
Civil Surgeon, Hooghly

II—MADRAS

THE oldest list of the Madras Medical Service, of which I have been able to get a copy, is one

contained in the Madras Army List of 1793, of which there is a copy in the Imperial Library in Calcutta. The next year of which a copy is available there is 1800. Older lists, even older printed lists, have existed, and may still be in existence. In the Madras Press Lists of ancient Documents, under date 2nd December 1785, is a letter in which Surgeon Arthur Sinclair claims seniority over Mr Davis, in "the list of Madras Surgeons, published by Authority in the Calendar of 1785."

This list of 1793 contains 101 names, viz, Hospital Board, 3, Head Surgeons, 3, Surgeons, 21, and Assistant Surgeons, 74. A few manuscript corrections have been made by hand in the printed list, probably by the original owner, some 116 years ago. The second of the three Head Surgeons, George Binny, Masulipatam, has been struck out, and in place of it the name, William Gordon, Masulipatam, has been written in. Gordon's name does not appear at all in the printed list, he was unemployed when it was published. He entered the service in 1758, and died at the Luz, Madras, on 4th September 1793. The name of Thomas Spalding has been written in 10th on the list of Assistant Surgeons, in the printed list it stands 27th. The names of two other Assistant Surgeons have also been

List of Madras Medical Service in 1793

Date of first Commission	Name	Appointment	REMARKS
<i>Hospital Board</i>			
1762	James Anderson, M D	Physician General and President	Surgeon General, 16th October 1781, Physician General and first President, Medical Board, 1786. Died at Madras, 5th August 1809.
9th January 1764	Colley Lyons Lucas	Chief Surgeon	Formerly in H M's Army, Second Member, Medical Board, 1786. Died at Madras, 25th March 1797.
23rd February "	William Raine	Head Surgeon, General Hospital, Madras	Died on board the <i>Asia</i> , on passage home, 7th July 1800.
<i>Head Surgeons</i>			
4th August 1767	Terence Gahagan	Head Surgeon, Vellore	Medical Board, 22nd January 1800. Retired, 29th February 1812. Died in London, 21st January 1814.
13th " 1770	George Binny	Ditto Masulipatam	Died, 20th May 1793, at Masulipatam.
20th July 1772	Nicol Men	Ditto Trichinopoly	Formerly a cadet. Died at Fort St George, 3rd April 1804.
<i>Surgeons</i>			
28th May 1776	William Roxborough, M D	Samulecottah	Superintendent, Calcutta Botanical Gardens, 1793. Died in Edinburgh, 18th February 1815.
3rd September "	Robert Rollo	Cuddalore	Died at Cuddalore, 3rd March 1793.
21st October "	Jeremiah Addison	Nizam's Detachment	Died, October 1794.
7th June 1777	James Richardson	Ganjam	Medical Board, 17th October 1804. Died at Madras, 13th February 1807.
7th " "	Alexander Watson	Pallamecottah	Medical Board, 1810. Retired, 2nd April 1821.
7th " "	Joshua Gillespie	2nd Regiment, European Infantry	Resigned, 14th May 1799.
" "	William Ruddiman, M D	Apothecary	Retired, 5th February 1793.
" "	George Ogilvie	Madura	Retired 11th August 1802. Died in England, 12th September 1813.
" "	Alexander Anderson	1st Battalion, Artillery	Died at Baishwarpotham, near Chitalding, 28th April 1805.
1st December 1779	Maxwell Thomson	4th Regiment, European Infantry	Died at Vepey, 23rd May 1807.

List of Madras Medical Service in 1793—(continued)

Date of first Commission	Name	Appointment	REMARKS
<i>Surgeons—(contd.)</i>			
6th July 1780	Edward Stuart	Tanjore	Dentin reported, 24th March 1795
1st August 1781	Patrick Bowie	Madepollam and Ingeram	Retired, 13th June 1804
22nd May 1780	Henry Miller	1st Regiment, European Infantry	Retired, 16th August 1808 Died in Scotland, 26th October 1819
2nd February 1781	Robert Trotter	Garrison, Dindegul	Died at Tanjore, 10th November 1793
17th August 1781	Charles Ogilvy	Vizagapatam	Retired, 30th July 1800
14th April 1783	John Walker	Chingleput	Died at Madras, 19th February 1795
4th July 1783	Henry Harris, M D	Black Town	Medical Board, 24th March 1807 Died at Fort St George, 10th August 1822
27th November 1784	Alexander Seivewright	2nd Battalion Artillery	Died at Ser.,—March 1793
27th September 1784	Andrew Berry, M D	Secy, Hospital Board	Medical Board, 24th February 1807 Retired, 10th August 1814 Died at Newton House Perthshire, 24th August 1833
30th May 1786	George Baird	Invalided, Negapatam	Died in Europe, 23rd February 1798
1779	Anthony Simoons	Invalided, Cuddalore	Invalided 1788 Died at Cuddalore,—February 1803
<i>Assistant Surgeons</i>			
14th October 1786	Fowke Moore	19th Battalion, N I	Invalided, 1793 Died at Wallajahabad,—May 1795
17th June 1786	Bernard M'Mahon		Died at Motapilly, in Ceylon, 4th June 1798, after escaping in a boat from the wreck of the <i>Crocodile</i>
5th September 1786	James Ramsay	Vellore Hospital	Died at Madras, 28th January 1795
6th November 1786	Charles Fleeming	18th Battalion, N I	Retired, 24th January 1812
1st December 1786	John Inglis	3rd Regt, Native Cav., Ellore	Died,—March 1809
4th July 1783	Alexander Boswell		Medical Board, 10th July 1812 Retired 17th February 1819
9th June 1787	John Duncan	Condapilly	Medical Board, 22nd February 1819 Died at Madras, 10th April 1819
11th July 1787	George Baillee	Medical Store keeper, Madras Hospital	Died at Baitumghum Madras, 20th February 1826
5th December 1785	Maurice Fitzgerald	Masulipatam Hosp	Retired, 1st May 1811 Died, 15th March 1838
17th June 1788	Whitelaw Ainslie	Ganjam	Retired, 25th February 1815 Knighted, 10th June 1835
9th August 1788	William Norman	12th Battalion N I	Died at Taunton, 17th July 1811
1st August 1788	John S Hathway, M D	Trichinopoly Hosp	Died, 9th May 1796
18th June 1788	Andrew Ponton, M D	29th Battalion, N I	Died at Madras 3rd November 1795
7th August 1788	George Wilson	20th Do	Retired, 13th November 1805
1st September 1788	Alexander Kennedy	28th Do	Retired, 1st April 1812 Died, 27th March 1829
5th August 1788	Samuel Barber	22nd Do	Died at Chitalding, 17th July 1802
2nd September 1788	William Todd	11th Do	Invalided, 3rd November 1807 Died at St Thomé, Madras 12th February 1808
4th October 1788	Thomas Thackeray	4th Regt, Native Cav	Retired, 5th October 1804
15th October 1788	Thomas Phippard	Rampore and Nellore	Formerly Surgeon R N Died, 26th October 1797 at Mugaltai, Godavery
14th November 1788	Alexander Mackenzie	17th Battalion N I	Retired 2nd May 1815
19th June 1788	Thomas Pollard	General Hospital, Trichinopoly	Invalided, 22nd January 1800 Died at Pondicherry, 19th March 1800
16th July 1788	Valentine Conolly	Governor's Body Guard	Father of Arthur Conolly, murdered at Bokhara 1842 Retired, 2nd February 1803
21st August 1788	James Johnston	5th Regiment, Native Cavalry	Died in England 1800
13th September 1788	Francis Duncarn, M D	With 36th Regiment	Retired 26th November 1800 Died, 10th October 1824
14th October 1788	Archibald Spires	14th Battalion, N I	Died at Cape of Good Hope, on passage home, April 1798
31st May 1788	George Anderson	3rd Ditto	Died at Bangalore, 4th August 1870
30th June 1788	Thomas Spalding	1st Regiment, Native Cavalry	Invalided, 22nd December 1807 Died at Madras, 3rd November 1812
21st November 1789	Robert Gallaway	Sick at the Presidency	Died at Masulipatam, 6th July 1803
22nd December 1789	John King	30th Battalion N I	Dismissed by Court Martial 10th May 1803
23rd January 1790	John M'Arthur	General Hospital, Trichinopoly	Died at Cuddalore, 17th September 1799
12th February 1790	David Haliburton	Chicacole	Died at Morigall, 22nd November 1800
14th March 1790	William Tait	4th Battalion, N I	Retired 16th February 1813 Died in London, 7th May 1827
14th April 1790	William Martin	Dindigul	Died in Camp, near Jaulnah, 9th September 1804
12th May 1790	John Goldie	2nd Battalion, N I	Retired, 31st December 1823 Died in London, 11th June 1855
29th June 1790	Francis Blake	21st Ditto	Died at Palamcottah, 7th March 1794
19th July 1790	Henry Hawkes	1st Ditto	Died at Jaffnapatam, Ceylon, —November 1796
20th August 1790	John Abernethie	1st Regiment European Infantry	Died, 21st December 1804
23rd March 1790	James Barter	9th Battalion, N I	Surgeons Mate, 23rd Light Dragoons, 1784 Died at Masulipatam, 22nd September 1807
24th April 1790	Edward Mackay	5th Ditto	Invalided, 4th October 1803 Died at Negapatam, 21st February 1810

List of Madras Medical Service in 1793—(concluded)

Date of Ist Commission	Name	Appointment	Remarks
<i>Assistant Surgeons—(contd)</i>			
2nd June 1790	John Castejade	7th Battalion, N I	Died at Cuddalore, 1st February 1798
21st January 1791	James Gilmore	24th Ditto	Retired 22nd April 1810 Died at Heine Bay, Kent, 6th May 1828
22nd " "	Patrick Nicol	27th Ditto	Died at Peterhead, 21st August 1801
19th " "	William Le Mesurier	General Hospital, Madras	Died of fever at Salem,—September 1793
24th " "	William Stuart	10th Battalion, N I	Died at Madras, 18th May 1799
25th " "	Samuel M'Morris	25th Ditto	Retired, 13th February 1805 Died, London, 29th April 1850
26th " "	Wynne Peyton	General Hospital, Madras	Retired, 16th June 1826 Died, 10th October 1840
19th " "	William Corkoley	13th Battalion, N I	Death reported, 25th July 1794
28th " "	George Dunbar, M D	2nd Regt European Infy	Died at Ganjam, 25th August 1805
29th " "	William Oide	6th Battalion, N I	Retired, 7th March 1815 Died in London, 23rd May 1818
" "	Thomas La Rive	2nd Battalion, European Art'y	Died at Conjaillie, 19th May 1795
25th June " "	John Crilly	2nd Regt, Native Cav	Died on board the <i>Ternet</i> , in Straits of Malacca 30th September 1800
26th " "	John Douglas White	26th Battalion, N I	Medical Board, 2nd April 1821 Died of cholera at Madras, 27th May 1824
19th September " "	Thomas Huckesby	16th ditto	Died at Rampet, North Arcot, 2nd Oct 1793
" "	James Munro	15th ditto	Died, date not known
1st July " "	James Dalton	With 7th Regt	Died in England, 16th September 1823
2nd " "	Charles Oram	Genl Hosp, Madras	Died at Madras, 11th August 1798
11th " "	James Wright	23rd Battalion N I	Reported dead, 28th April 1794
6th May " "	Robert Bryden	Genl Hosp, Trichinopoly	Died at Bellamcondah, 15th Nov 1793
6th July " "	John Steddy	South of the Coleroon	Died at Waltan, 14th November 1817
1st October 1790	Ephraim Morton	Sick at the Presidency	Died—1793, on passage to Mauritius from Cape
2nd October " "	Richard Jackson Todd	Gone to sea for health	Died Decr 1793
8th July 1791	Michael O'Donoghue	8th Battalion, N I	Died at Chatterpore, 21st June 1806
23rd October 1790	William Betty	Dispensary	Cashiered, 6th October 1803 Retired, 7th March 1805 Died, 6th May 1810 at Vizagapatam
10th " "	Charles O'Neil	Genl Hosp, Trichinopoly	Died at Negapatam, 3rd November 1797
13th August 1792	Anthony Babington	3rd Regt, European Infy	Died at Malacca, 1st August 1803
15th " "	Archibald M'Millan	1st Battalion, European Art'y	Died December 1793
17th " "	Joseph Street	Vizagapatam	Died at Masulipatam, 10th June 1809
18th " "	Robert Addison	Genl Hosp, Madras	Died at Banda, 5th November 1801
20th " "	David Mudie	Ditto Masulipatam	Died at Pondicherry, 21st January 1807
21st " "	Richard Stone	Ditto do	Died at Manantoddy, 22nd September 1806
22nd " "	John Deeks	Ditto Vellore	Asst Surgeon, Bengal, 22nd February 1792
23rd " "	Samuel Lockhart	4th Regt, European Infy	Transferred to Madras, exchanged with R Reddick Died—November 1796
25th " "	John Carme	Genl Hosp, Vellore	Died at Madras, 23rd April 1797
22nd May " "	Duncan McGibbon	Ditto Madras	Retired, 15th March 1805
			Died, 16th December 1804

struck out, Francis Blake and William Le Mesurier Binny died in May, and Le Mesurier in September 1793, Blake in March 1794

The years 1793 and 1794 were extremely fatal to the Madras Medical Service. In 1793 died Head Surgeons Binny and Gordon, Surgeons Trotter and Sievwright, and Assistant Surgeons Moore, Le Mesurier, Huckesby, Brydon, Morton, Todd, and Macmillan, in 1794 Head Surgeon Adderton, and Assistant Surgeons Blake, Lettsom, Wright, Morton, and Maclean, the last named not in the list of 1793. Though appointed in 1792, he had not arrived when the list of 1793 was published. He and Assistant Surgeon W Colquhoun were wrecked on Madagascar, in the *Winterton*, on their passage out. With so many deaths, the service was extremely short-handed, and several appeals were sent home to the Court of Directors to send out more Assistant Surgeons. A considerable number were sent out in 1795 and 1796.

Adderton had succeeded Gordon as Head Surgeon in the Circars. This appointment is sometimes called that of Head Surgeon in the

Circars, at other times Masulipatam, Ellore, or Ganjam indiscriminately. Three holders of this appointment, Binny, Gordon, and Adderton, died within eighteen months. Adderton was succeeded by James Richardson, who held the rank for ten years, after which he succeeded to a place on the Medical Board, on promotion he exchanged with Nicol Mein, Head Surgeon, Trichinopoly, who retained the Circars for eight years, till he succeeded to the Medical Board in 1802.

The printed list gives merely the names, divided into four ranks, Hospital Board, Head Surgeons, Surgeons, and Assistant Surgeons, and the appointment held by each man. No dates of commissions are given. In the list as printed the first column, date of first commission, and the fourth column, showing date of death or retirement, have been added by myself.

Those officers against whose names only their station is shown, without any further remark, were apparently in civil employ, all the rest doing military duty. If this is correct, eleven of the twenty-one Surgeons, and six of the 74

Assistant Surgeons, were in civil employ, the other 84 in military employ. The administrative appointments were all considered military. One Surgeon is shown as invalided, two Assistant Surgeons as sick at the "Presidency," and one as "gone to sea for his health." Two Assistant Surgeons were doing duty with King's regiments of Infantry, then stationed in the Madras Presidency, 36th (Herefordshire) and the 74th (Highlanders).

No less than twenty-one out of the 101 names, more than one-fifth of the whole number, are not given in Dodwell and Miles' *East India Medical List*, viz., Head Surgeon Binny, Surgeons Rollo, Adderton, Ruddiman, Stuart, Walker, and Sievwright, Assistant Surgeons Moore, Ramsay, Hathway, Blake, Le Mesurier, Lettison, La Rive, Hickersby, Munro, Wright, Brydon, Todd, and Macmillan. The name of Head Surgeon Gordon, which has been interpolated in manuscript, is also omitted in Dodwell and Miles' list.

(To be continued)

I M S DINNER IN EDINBURGH

THE Fourth Annual Scottish dinner of the Indian Medical Service was held as usual in the Caledonian United Service Club, Edinburgh, on the evening of Friday, May 28th, Sir Alexander Christison, *Bart*, the senior member of the service, presided, and the following officers were present: Surgeon-Generals G. Bidie, CIE, P. S. Turnbull, KES, D. Sinclair, CSI, and G. W. R. Hay, Colonels W. P. Warburton, CSI, and A. Stephen, Brigade-Surgeons G. G. MacLaren, J. Robb and J. Annett, Lieut-Colonels R. M. Downie, W. B. Bannerman, J. C. Lamont, J. C. C. Smith and G. J. H. Bell, Major C. J. Robertson Milne, Captains W. F. Harvey, G. H. Stewart, J. Husband, J. Masson, Munson, Kirkwood, Macrae Roberts and Tan, Surgeon-Generals Pinkerton and W. Watson, Lieut-Colonel F. Wyville Thomson and Capt. A. N. Fleming were unable to be present. The guests on the occasion were—Sir Halliday Croom, S. Allan Jamieson, Mr. J. J. M. Cotterill, Colonel T. Corker, R. A. M. C. P. M. O., Scottish Command, N. P. S. McBride, Dr. F. W. Haultain and Lieut. Bruce Turnbull of the 23rd Sikh Pioneers. The usual loyal toasts followed the dinner and then the President proposed the toast of the evening "The Indian Medical Service." In doing so he referred to the very recent death of Assistant-Surgeon W. W. Ireland, who had actually indicated his intention of being present, and whose interesting reminiscences at the dinner of the previous year will never be forgotten by those who were privileged to hear them. He also regretted the absence of some of the older members of the service, and in doing so pointed out the great and useful purpose which this dinner affords—an opportunity for the retired members of the service residing in or near Edinburgh, who are unable to attend the dinner in

London, to meet not only each other but to become acquainted with those who are still on the active list. Sir Alexander especially extended a warm welcome to the comparatively large number of junior officers present.

Surgeon General Sinclair proposed the "Royal Army Medical Corps," to which Colonel Corker responded making exceedingly kind references to his many associations with the service in India. Surgeon-General Hay proposed the Royal Colleges to which the Presidents suitably replied, Mr. Cotterill pointing out how much the College of Surgeons were doing to help members of the service in their post graduate studies. The proceedings terminated by drinking the health of the Chairman which was proposed by Colonel Warburton, and in replying Sir Alexander declared that the work of organising the dinner so successfully was entirely to the credit of Colonel Annett. Colonel Annett in responding shortly, thanked the officers present for so readily acquiescing in the plans for the function. He further stated that he had had the pleasure of meeting again a brother officer with whom he was associated more than 40 years ago in the Abyssinian Campaign and whom he had not seen in the interval.

It is interesting to note—the Civil Surgeon of Hooghly will, at least, be interested in this that a permanent record of these dinners has been instituted by Colonel Annett, all present signing a book and entering in it the details of their service. This dinner is always held on the last Friday in May, and officers residing in or near Edinburgh should make a point of attending it.

Service Notes.

OBITUARY

SURGEON MAJOR CHARLES KNIGHT WEBB, Bengal Medical Service, retired, died on 7th April 1909. He was born in April 1823, entered the I. M. S. as Assistant Surgeon on 1st July 1846, after having taken the diploma of M. R. C. S. in 1845, became Surgeon on 25th September 1859, and Surgeon Major on 1st July 1866, retiring on 7th January 1871. He served in the Indian Mutiny, going through the campaign in Rohilkand, up to the capture of Bareilly in 1858, with the 2nd Panjab Infantry and also with the 4th Panjab Infantry in the Mahsud Waziri campaign of 1860.

SURGEON MAJOR PATRICK FRANCIS BELLEW, Bengal Medical Service, retired, died on 16th May 1909. He was born on 12th August 1832 took the diplomas of M. R. C. S. and L. M., and of L. S. A., in 1854 entered the I. M. S. as Assistant Surgeon on 6th September 1854, became Surgeon on 6th September 1866 and Surgeon Major on 1st July 1873, retiring on 1st December 1882. Though in India during the mutiny, his only war service was the Sonthal Rebellion of 1855, much of his service was spent in the Assay Department of the Mint.

BRIGADE SURGEON GEORGE ARCHIBALD MACONACHIE, Bombay Medical Service, retired, died at Aberdeen on 25th June 1909. He was educated at Aberdeen University, where he took the degrees of M. B. and C. M. in 1868, and M. D. in 1872, and at Paris, he also took the diploma of M. R. C. P., London, in 1887. He entered the I. M. S. as Assistant Surgeon on 1st April 1867, becoming Surgeon on 1st July 1873, Surgeon Major on 1st April 1879 and Brigade Surgeon on 1st May 1890, and retired on 22nd June 1897.

He served in Abyssinia in 1867-68, and held the medal for that campaign. He had been Lecturer on Tropical Diseases in the University of Aberdeen since 1899. Previous to his retirement he was for many years Professor of Ophthalmology in the Bombay Medical College.

RETIREMENTS

LIEUTENANT COLONEL JULIAN CARTER CARRINGTON SMITH, of the Bengal Medical Service, retired on 7th August 1909, on attaining the age of 55. He was born on 7th August 1854. Educated at Edinburgh University, where he took the degrees of M.B., C.M., in 1878, and entered the I.M.S., as Surgeon on 31st March 1879, becoming Surgeon Major on 31st March 1891, and Lieutenant Colonel on 31st March 1899. He served in Afghanistan in 1879-80, and in Burma in 1886-88, in the operations of the first Brigade, and had the medal for these two campaigns, that for Burma with two clasps. Most of his service was spent in the North West, now the United Provinces, latterly as Civil Surgeon of Meerut. He had been on furlough for nearly two years past.

MAJOR HERBERT ST JOHN FRASER Madras Medical Service, retired on 18th June 1909. He was born on 3rd April 1863, took the diplomas of M.R.C.S. and L.R.C.P. London, in 1892, and entered the I.M.S. as Surgeon Lieutenant on 29th January 1894, becoming Surgeon Captain on 29th January 1897, and Major on 29th January 1906. He served on the N.W. Frontier of India in 1897-98, on the Malakand, and got the medal and clasp for that campaign, also in Tirah in 1897-98, being present at the actions of the Sampagh and Ashanga passes and in the operations in the Bazar valley from 25th to 30th December 1907, getting an additional clasp. He had been on temporary half pay since 9th October 1908.

On completion of the special duty to which he was posted, and on relief by Lieutenant F.C. Fraser, M.D., I.M.S., of his additional duty at the Central Jail, Rangoon, Major W.G. Pridmore, M.B., I.M.S., is placed on general duty at the General Hospital, Rangoon, and placed in charge of the Government Plague Hospital, Rangoon, in addition to his own duties in place of Major E.R. Rost, I.M.S.

LIEUTENANT A.H. NAPIER, I.M.S., assumed charge of the Civil Medical duties of Sheikhbudin Sanitarium on the forenoon of the 6th of May 1909.

CAPTAIN H.W. PIERPOINT, I.M.S., assumed charge of the Civil Medical duties of the Bannu District on the afternoon of the 6th July 1909, relieving Captain H.S. Hutchison, M.B., I.M.S.

CAPTAIN O. ST JOHN MOSES, I.M.S., Officiating Resident Surgeon, Medical College Hospital, Calcutta, is appointed to act as Civil Surgeon of the second class and is posted to Midnapore, with effect from the forenoon of the 1st July 1909.

CAPTAIN F.P. CONNOP, I.M.S., Officiating Resident Surgeon, Medical College Hospital Calcutta, is appointed temporarily to act as Resident Physician of that institution, in addition to his own duties, with effect from the afternoon of the 30th June 1909.

MAJOR C.J. ROBERTSON MILNE, M.S., has been granted, by His Majesty's Secretary of State for India, an extension of furlough for one month and three days.

CAPTAIN E.J.C. McDONALD, I.M.S., Assistant Plague Medical Officer, Sialkot, has been granted privilege leave of absence from the date he may avail himself of it to the 31st August 1909.

On return from the leave granted to him Captain C.E. Southon, I.M.S., resumed charge of the duties of District Plague Medical Officer, Ludhiana, on the afternoon of the 26th June 1909.

On transfer from Multan, Captain W.W. Jendwine, I.M.S., assumed charge of the duties of District Plague Medical Officer, Gurdaspur, on the afternoon of the 26th June 1909.

CAPTAIN W.S. NEALOR, R.A.M.C., is appointed to hold collateral charge of the Civil Surgeoncy at Thayetmyo, as a temporary measure, pending the arrival of Captain R. Kelsall, M.B., I.M.S.

SECOND Class Military Assistant Surgeon A.G. Culpeper is appointed to officiate as Civil Surgeon of the Magwe District, in place of Captain R. Kelsall, M.B., I.M.S., transferred.

CAPTAIN R. KELSALL, M.B., I.M.S., is appointed to the Civil Medical charge of the Thayetmyo District, in place of Major F.A.L. Hammond, I.M.S., who has proceeded on leave.

CAPTAIN C.F. WEFMAN, I.M.S., Officiating Civil Surgeon, Midnapore, is allowed privilege leave for three months under article 260 of the Civil Service Regulations, with effect from the 24th June 1909, or any subsequent date on which he may be relieved.

INDIAN MEDICAL SERVICE—SPECIALIST—The undermentioned officer is appointed a specialist in (a) Electrical Science with effect from 17th June 1909.

Lieutenant W.L. Watson, 5th (Mhow) Division

INDIAN MEDICAL SERVICE—SPECIALIST—The undermentioned officer is appointed a specialist in the subject noted with effect from 1st June 1909.

Prevention of Disease

Captain H.O. Browne, I.M.S., Brigade Laboratory, Dera Ismail Khan

LIEUTENANT COLONEL H. HENDLEY, I.M.S., Civil Surgeon, Ambala, has obtained privilege leave of absence for 21 days combined with leave on medical certificate for 1 year 3 months and 9 days, under articles 260, 243 and 311 of the Civil Service Regulations, with effect from the 16th of April 1909.

PRIVILEGE leave for three months, under article 260 of the Civil Service Regulations, is granted to Major N.R.J. Ramner, I.M.S., Civil Surgeon, Chhindwara, with effect from the 19th August 1909, or the subsequent date on which he may avail himself of it.

The services of Lieutenant Colonel T. Grainger, V.D., I.M.S., are replaced at the disposal of His Excellency the Commander in Chief in India.

The services of Captain R.F. Baird, I.M.S., are placed permanently at the disposal of the Government of the United Provinces.

INDIAN MEDICAL SERVICE—SPECIALIST—The undermentioned Officer is appointed a specialist in (d) Ophthalmology with effect from 13th May 1909.

Captain W.H. Hamilton, 5th (Mhow) Division

INDIAN MEDICAL SERVICE—To be Colonel. Dated 13th January 1909.

Lieutenant Colonel Robert William Steel Lyons, M.D. Majors to be Lieutenant-Colonels. Dated 30th March 1909.

Faith Russell Ozzard, Adam Rivers Steel Anderson, M.B., John Telfer Culvert, M.B., William Symonds Percival Ricketts, M.B., Charles Malcolm Moore, M.D., Edgar Jennings, Arthur Gervase Hendley, George William Jenney, M.B., Charles Tilson Hudson.

The services of Captain J.W. Illius, I.M.S., are placed permanently at the disposal of the Government of Madras.

LIEUTENANT COLONEL E.C. HARE, I.M.S., Sanitary Commissioner, Eastern Bengal and Assam, is granted privilege leave for one month and twenty one days, with furlough for four months and nine days and study leave for three months in continuation, with effect from the 8th May 1909.

COLONEL R.N. CAMPBELL, M.B., I.M.S., Inspector General of Civil Hospitals, Eastern Bengal and Assam, is granted privilege leave for three months, with effect from the 18th July 1909.

LIEUTENANT COLONEL E.A.W. HALL, M.B., I.M.S., is appointed to officiate as Inspector General of Civil Hospitals, Eastern Bengal and Assam, during the absence on leave of Colonel R.N. Campbell, M.B., I.M.S., or until further orders.

ORDER OF THE INDIAN EMPIRE

His Excellency the Grand Master of the Most Eminent Order of the Indian Empire is pleased to announce that His Majesty the King, Emperor of India, has been graciously pleased to make the following appointment to the said order.

To be Companions

Lieutenant Colonel Robert Neil Campbell, M.B., I.M.S., Officiating Inspector General of Civil Hospitals, Eastern Bengal and Assam.

THE services of Major F D Browne, I M S, an officer of the Jvil Department Bengal, employed temporarily on general duty in Calcutta, are replaced at the disposal of His Excellency the Commander in Chief in India

CAPTAIN WILLIAM JACKSON POWELL, M B, I M S, is appointed to act as Superintendent of the Central Jail, Midnapore, with effect from the 5th June 1909

THE following officer is appointed a specialist in (c) Advanced Operative Surgery, with effect from 31st May 1909 — 6th (Poona) Division—Captain A F Hamilton

CAPTAIN H INNES, I M S, Civil Surgeon, Cachar is appointed temporarily to be Civil Surgeon of Dacca during the absence on deputation of Lieutenant Colonel E A W Hall, I M S

THE following is published for information of officers of the Indian Medical Service —

The Right Hon'ble the Secretary of State for India, in communication with the Army Council, has decided that service in the South African War in the capacity of a civil medical practitioner, shall, in the case of an officer afterwards admitted to the Indian Medical Service, reckon to wards service for Indian pension. Officers who wish to claim the concession, but who have not yet established their claims thereto, should submit their applications for verification through the usual channel, stating the period of their service in South Africa, and the capacity in which they served during the operations

MAJOR N R J RAINIER, I M S, Civil Surgeon, 2nd Class, is appointed to officiate as Civil Surgeon, 1st Class, with effect from the 7th May 1909, *vice* Lieutenant Colonel R B Roe, I M S, on leave, or until further orders

CAPTAIN A W TUKE I M S, was placed on special cholera duty at Nasik from the 31d April to the 12th May 1909

THE services of Captain L Reynolds I M S, are placed at the disposal of the Army Department

THERAPEUTIC NOTES

MESSRS R SUMMER & CO, of Liverpool, are placing on the market "SPECIAL COVERS" for vessels containing milk sugar and other food materials likely to be contaminated by flies. These or similar covers we have seen in use for years and they do the work they are intended for most satisfactorily. All materials for food should be preserved from flies and in India we all know what a nuisance flies can be. By using these covers this source of danger of infection can be eliminated.

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BOOKS, REPORTS, &c, RECEIVED —

- Persian "Self taught" No 22, Marlboroughs series By S Hasan Es (Messrs E Marlborough & Co, 1909)
- The Edinburgh Stereoscopic Atlas of Obstetrics By Simpson & Burnet, Sect IV
- Invalid Cookery By Miss Pearson and Mrs Byrde (Messrs Thacker, Spink & Co)
- Annual Report of Government General Hospital Madras, 1908
- A Study of the Bacteriology of Drinking Water Supplies in Tropical Climates By Major W W Clemesha, I M S, Asst Surg, 1 S Ayar and V G Mudalyar, King's Institute Gundy
- Report on the Jail Administration in Eastern Bengal and Assam, 1908
- Sleeping Sickness Bureau Bull No 7, 1909
- Report on the Administration of the Jails of the Punjab, 1908
- The After treatment of Operation P Lockhart Mummery, F R C S (Messrs Baillière, Tindall & Cox) 1909
- Administration Report, Jails of Bengal, 1908
- Stone in the Bladder, etc By Lt Col, Park, I M S, (reprint from paper read at Bombay Medical Congress)
- Annual Sanitary Report of the Province of Eastern Bengal and Assam, 1908
- A System of Medicine Alibutt & Rolleston (Messrs MacMillan & Co, 1909)
- The Cause and Cure of Consumption By H V Knaggs (Messrs Jarrold & Sons, London, 1909)
- The Campaign against Microbes By Etienne Bernet and Pasteur Institute Translated from the French E D Ans, F R S (Messrs John Bale, Sons and Danielsson, Ltd 1909)
- The Modern Mother A Guide to Girlhood, Motherhood and Infancy By Dr H Lang Gordon (Messrs T Wernur Laurie, London, 6s) net
- Synoptic Chart of Cardiac Examination (Messrs John Bale, Sons and Danielsson, Ltd, London)
- An Atlas of Dental Extractions with Notes on the Causes and Relief of Dental Pain By C E Wallis, M R C S, R C P L S S, 1 & A, Churchill, London, 1909
- Immunity and Specific Therapy By W D Este Emery, M D (Messrs H K Lewis, Gower Street London 1909)
- Annual Report of the Presbyterian Mission Hospital, Meraj 1908
- The Pocket Prescriber By James Burnet M A, M D (John Currie, Edinburgh 1909) Price 1s net
- Report of the Sanitary Administration of the Punjab, 1908
- Military Sanitation By Major R J Blackham, R A M C (Messrs Thacker, & Co Ltd, London, 1909)
- Report on the Lunatic Asylums under the Government of Bombay, 1906—1908

LETTERS, COMMUNICATIONS, &c, RECEIVED FROM —

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Original Articles.

THE TREATMENT OF IMMATURE CATARACT*

By HENRY SMITH,

MAJOR, I M S,

Civil Surgeon of Jullundur, Punjab

IMMATURE cataract is generally recognised as unsuitable for the capsulotomy operation while in the immature condition, and I think justly so. By this operation it is impossible to get all the lens matter detached from the capsule, the result of which is that, if operated on by that method, a considerable amount of lens matter is left behind. This swells up and becomes opaque, and is exceedingly likely to give rise to a severe form of *iritis*, which will probably bind down the iris to the capsule, and which with the capsule and its cell proliferation will form a very dense after-cataract.

For the treatment of such an after-cataract a mere needling operation is not sufficient. To efficiently treat such an after-cataract, it is necessary to extract it. If the iris is extensively bound down to such an after-cataract, it is necessary at the time of its extraction to mechanically detach it from the after-cataract with an instrument and then to proceed with the extraction of it.

Such an after-cataract could be couched, if not adherent to the iris, but couching would, in my opinion, be certain to be followed by the degenerative condition of the retina which invariably follows couching of the cataractous lens—*retinitis pigmentosa sine pigmento*,—though not with so much rapidity of progress. I have seen the results of the work done by the immemorial lens couchers in the Punjab, and have examined the cases carefully. This form of degeneration is invariable in their most favourable results. The larger the nucleus of the lens couched the more rapid its progress as the nucleus and capsule are apparently never absorbed, whereas the soft matter within the couched capsule is absorbed.

It will thus be seen why few are willing to undertake the treatment of the after-cataract which follows the extraction of the immature lens by the capsulotomy method with a light heart. The following case, in my observation, is a typical example of the complication, which practically always follows the extraction of the immature lens by the capsulotomy method.

A B—immature cataract in both eyes—was the principal of an extensive business firm. His visual incapacity involved large monetary issues to himself and others, so he was willing to accept any risk. In the autumn of 1906

an iridectomy was performed with the object of maturing his cataract by one of the most experienced operators by the capsulotomy method in the world. The result was nil. There was no more progress in the maturing of the cataract in that eye than in the other eye which was equally advanced. A few months after the iridectomy he had the immature cataract extracted by the capsulotomy method by the same operator.

Five months after the extraction I saw him for the first time. The condition then was as follows—His eye was and had been bandaged ever since the operation and he was suffering considerable pain. He was using atropine drops. On examination there was marked evidence of an active irido-cyclitis, the perception of light was very good, the after-cataract was very dense, the margin of the iris was bound down to it all round. The operator and another consultant of the same school informed him that they regarded the operation as a failure and that nothing further could be done.

The pressing claims of patients, with cataracts slowly maturing by nature's process, often keeping the patient almost blind for years before the case would be suitable for operation by the capsulotomy method, rendered it imperative that some means should be tried for their relief, hence the various procedures adopted for the maturing of immature cataract. The procedures adopted for the purpose are—

- (1) Puncturing the lens capsule with a needle.
- (2) Iridectomy (simple)
- (3) Iridectomy with massage through the cornea

- (4) Iridectomy with direct massage with some form of instrument

(1) Puncturing the lens capsule is liable to be a complete failure or to establish a traumatic cataract. A traumatic cataract thus established may constitute a serious ophthalmic emergency. The formation of the traumatic cataract may be so rapid that the lens may swell up to such a degree as to cause acute glaucoma, and the lens matter may escape into the aqueous chamber and cause acute iritis or iridocyclitis.

The extraction of such a traumatic cataract admits of no delay. The conditions under which it has to be extracted are highly unfavourable and difficult, and the results are far from being as satisfactory as in the extraction of a cataract matured by nature's process. It will thus be seen that when this procedure is efficient in maturing a cataractous lens, that is, when it causes a traumatic cataract, it is fraught with serious trouble and serious danger, and is now, I think, relegated to the operations of the past.

- (2) Iridectomy in my observation has no influence whatever on the maturing process.

- (3) Iridectomy with massage through the cornea has been done extensively. In my

* Paper read at the annual meeting of the American Ophthalmological Society at New London, July 16th, 1905.

observation it has no influence on the maturing of immature cataract, if the massage be done with a justifiable degree of pressure—that is pressure which will not dislocate the lens. It is only an experienced operator who knows the amount of pressure justifiable. If any excess of pressure be used, the operator is very liable to dislocate the immature lens in an eye from which the aqueous humour has been released by an iridectomy. Under these circumstances the immature lens is often very easily dislocated, so that in my opinion it this procedure be adopted within safe limits both the surgeon and the patient are almost certain to be disappointed.

(4) Iridectomy with direct massage of the lens with an instrument. This procedure was adopted on account of the failure of simple iridectomy and of iridectomy with massage through the cornea—the simpler methods. This is a daring and a most unsafe procedure. Only those familiar with the extraction of the immature lens in the capsule can fully realize how delicate the capsule in these cases is and how easily it can be lacerated by the application of the bluntest and smoothest of instruments, in the hands of men most highly trained in ophthalmic manipulation and also how easily the lens can be dislocated in these cases by such direct manipulation. If neither of these undesirable accidents occurs, I cannot see how direct massage can be more effective than massage through the cornea. If, either of these accidents does occur, the operator is in the awkward position of being obliged to extract the immature lens without delay the best way he can. It will thus be seen that ripening procedures are either dangerous or disappointing, and that the Surgeon would be better advised to either wait on Nature's ripening process or to extract immature cataract in the capsule.

While I condemn ripening procedures, I fully appreciate the demand which has caused their initiation—the demand for some procedure by which men of active, mental and bodily habits could be relieved of their condition without remaining practically blind for the years through which Nature's process would run before they could be operated on by the capsulotomy method. The demand is pressing, delay may mean want to the family whose breadwinner is the subject, it may mean when the subject has waited for his cataract to mature that his business has passed into other hands and that at his time of life he is badly fitted to begin a career *de novo*. It may mean that the community has lost a number of years of the services of one of its most important members. In any case the delay occasioned by waiting for the completion of Nature's ripening process involves mental depression, the degree of which can be best appreciated by those of extensive ex-

perience in the treatment of cataract, but hardly less so by the general practitioner whose patient the subject is, mental depression allied to that incident to the prospects of confinement in a dark cell without labour—a form of judicial punishment admissible in no civilized country. We come across patients who insist on a definite opinion be it good or bad and who will not be shelved. I have known such men, when told that they had immature cataract and that they could have to wait for a year or two before it could be operated on, suffer from mental depression consequent thereon which was little short of what could follow on a death sentence. The surgeon who intends to wait on Nature's process of maturing should be very careful to avoid informing patients that they have immature cataract, and, until he cannot help it and then he should not lead them to believe that they have long to wait for it to mature. This may seem to be humbugging the patient it is not, it is saving him as much as possible of the mental strain to which he could otherwise be subject. The surgeon can save his own reputation by informing some member of the family of the real state of affairs.

It will thus be seen that—

(1) Extraction of immature cataract by the capsulotomy method is hardly justifiable.

(2) Ripening procedures are either unsatisfactory or dangerous.

(3) To wait for Nature's maturing process is highly unsatisfactory and detrimental to the patient.

The treatment of immature cataract which I practise extensively, of which I am an ardent advocate and which I regard as the procedure of the future, and which will make mature senile cataract a much rarer condition than it is at present, is extraction of the lens in its capsule—a procedure to which immature cataract is admirably suited. In fact even the normal lens can be extracted in the capsule as easily as the ripe one by those skilled in the art. I have extracted the normal lens in its capsule in a number of cases like the following. A patient has mature senile cataract in one eye, I extract it. He has a large leucoma in the other eye to which the margin of the iris is adherent all round, it is thus impossible to see his lens. The perception of light is good and the eye is otherwise normal. I assume, and generally correctly, that the lens of this second eye is also cataractous. I make the incision for extraction of the cataract perform a large iridectomy and extract the lens in its capsule. On several occasions I have been mistaken for supposing it to be cataractous and have found that it proved to be absolutely normal when extracted. Such cases are very common in India, the result of trachoma, and such patients see remarkably well through a very small portion of clear cornea.

The stage of immaturity at which I advocate the extraction of immature cataract in the capsule is the stage at which it unfits its possessor for the performance of his ordinary duties. I hold that if no other reason than for the treatment of immature cataract, every ophthalmic surgeon should be familiar with the art of extracting the cataractous lens in its capsule.

The time allotted does not admit of my going over this operation in full detail. I have a monograph in the press on the treatment of cataract, in which I go into full detail for everything concerning extraction in the capsule among other things, but here I wish to state concisely a few of the leading points on this operation.

The patient and his eye are prepared as for the ordinary operation, atropine is not necessary on account of the exceeding infrequency of iritis following this operation. The operator sits on a stool at the patient's head, the assistant stands beside the operator. The assistant is thus not in the way of the operator.

The sclero-corneal incision is made with the speculum in and includes a little less than half the circumference of the sclero-cornea, I personally prefer the incision finished in the cornea without a conjunctival flap, as the flap is more or less in the way. An iridectomy may or may not be due according to the operator's fancy, the speculum is now removed, the assistant draws down the lower eyelid with his thumb placed on the skin below it, with his other hand he lifts the upper eyelid forward with a large sized strabismus hook in his three first fingers as if he were lifting the contents of the orbit out of the socket and not lifting it towards the brow, using the ring and little finger of the same hand to draw back the brow and orbicularis muscle. This does not imply any violence on the part of the assistant.

The operator now places the end of a largest sized ophthalmic spatula on the left side of the cornea over the junction of the middle and lower third of the lens. He places the end of a large sized blunt pointed strabismus hook over the corresponding position to the right of the spatula. He makes steady pressure backwards towards the optic nerve with this spatula and he makes similar pressure with the strabismus hook except that in making pressure with his strabismus hook he draws it backwards and forwards across the cornea. The edge of the lens at the wound will be seen to tilt forwards and the clear vitreous will be seen between it and the scleral margin of the wound. As soon as this occurs, the pressure with the spatula should practically cease and the same stroking movement of the strabismus hook should be continued, its position not being altered on the cornea at first, but the direction of the pressure exerted through it should be altered gradually more and more in the direction of the wound until it finally folds the cornea

beneath the lens, at this stage the lens is delivered. The iris should be replaced if prolapsed. The assistant should then let go the eyelid, and the patient's eye should be dressed up.

I may here state that my experience now extends to about 20,000 cataract extractions about 17,000 of which have been in the capsule, and amongst the latter have been many immature cataracts especially in recent years.

PYORRHOEA ALVEOLARIS; FROM A TROPICAL STANDPOINT

B. C. F. BADCOCK,

Dental Surgeon, General Hospital, Madras

PART I—THE DISEASE.

CHRONIC suppurative inflammation of the alveolo-dental periosteum, generally known as "Pyorrhoea Alveolaris," is a very common condition amongst Oriental races. In fact, it may be said to be the dental ailment of the Orient, as dental caries is of the Occident. It is, however, widespread amongst Western races, and perhaps especially so amongst the European population of the United States of America.

Perhaps for reasons not entirely unconnected with the last statement, more rubbish has probably been written about alveolar pyorrhoea under various names than about any other condition known to the dental surgeon.

It is of course Ambroise Paré to whom we are indebted (according to Mr Goadby) for the earliest known account of this disease. He wrote in the year 1550, "The teeth are also troubled with preternatural affects. For some times they ache by relaxation of the gums, by an internal or antecedent cause, as by defluxion of acid or watery humours from the brain, or by want of nourishment in old bodies. If the teeth grow loose by the means of decaying gums, the disease is then incurable."

"The term Pyorrhoea Alveolaris was proposed by Dr Reinhinkle at a meeting of the American Dental Association in 1877, but it appears to have been used by Wedl in a paper published several years previously" (J Fitzgerald).

Toniac, however, as Goadby tells us, gave a very accurate description of this disease under the term "alveolar pyorrhoea" so early as 1779.

As this condition is almost invariably a sequela of a constitutional dyscrasia, and furnishes a common cause of septic infection by way of the mouth, enquiry into its etiology invites the particular attention of the physician, especially as study of its prophylaxis is likely to yield more satisfactory results than that of its cure. When established, as Ambroise Paré found, it constitutes a most intractable condition, anything but radical treatment after the early stages being generally hopeless.

With the idea of suggesting further pathological and clinical observation of alveolar pyorrhoea in this country, I have prepared this paper, which is necessarily to a great extent a brief résumé of published writings on the subject.

The chief recent advance in our knowledge of chronic suppurative dental periostitis, or "Alveolar osteitis," which term he considers more in accord with its pathology, is comprised in the Erasmus Wilson Lecture on "Pyorrhoea Alveolaris" by Mr. K. W. Goadby, delivered in February, 1907, and published in *The Lancet*, *The British Dental Journal* and elsewhere, to which I would refer those interested in the subject for a very exact and detailed description of the disease and an account of the author's researches into its bacteriology. Appended to this lecture in the form of notes will be found a useful bibliography.

Mr. J. Fitzgerald's work on "Pyorrhoea Alveolaris and its relations to General Medicine" (Medical Publishing Co., London) should also be consulted.

In the following pages I make considerable use of the excellent account in Smale & Colyer's "Diseases and Injuries of the Teeth" (Longmans, Green & Co.)

ANATOMY AND PHYSIOLOGY

In inquiring into the nature of alveolar pyorrhoea, it will be useful to call to mind the anatomy of the parts involved.

In the human dentition the root of the tooth is coated by a thin layer of bone, termed, as a matter of convenience, *cementum*, so thin that its nutrition is provided for without permeation by bloodvessels. (In hypertrophied cementum, Haversian canals are occasionally seen.) This is connected to the bone of the alveolus by a layer of fibrous periosteum, the wavy white connective tissue fibres thereof being continuous at one end with the perforating fibres of the cementum, and at the other with those of the alveolar bone.

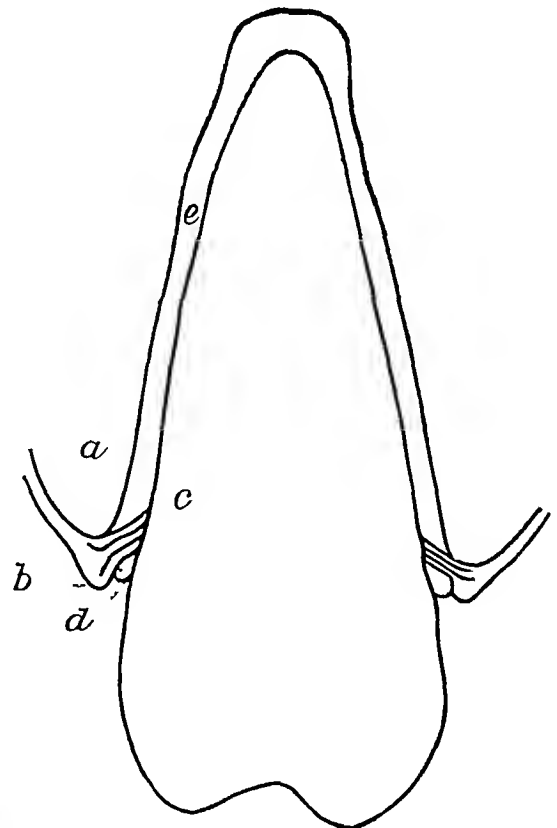
The nerve supply of the alveolo-dental periosteum is meagre, and is probably tactile rather than sensory. Neither is the blood supply, brought by terminal arteries, very liberal. The main arteries and nerves arise from trunks supplying the pulp, just before these reach the apical foramen. (It may be noted here that after middle life the pulp of the tooth has a tendency to fibrous or calcareous degeneration.) Vessels and nerves run up about midway between cementum and alveolar wall, and ramify chiefly in the layer of periosteal cells coating either bony surface. The blood supply is augmented by vessels from the gum and from the alveolar bone. The dental periosteum contains lymphatics, but their histology is still a moot point.

The innervation and vascularity of this tissue would therefore appear to indicate a low standard of resistance to injury.

Round the neck of the tooth the dental periosteum is thinner than elsewhere, and consists almost entirely of strong fibres which pass into the gum, forming what is termed the "dental ligament."

"The gum is attached in such a way as to leave a free margin round the tooth and form, as it were, a pocket. Tucked away in this pocket is a mass of 'round or polygonal gland-like epithelium.' This mass of cells, according to Black, although suggesting the formation of a gland, fails to assume a glandular structure. This tissue is known as the 'gingival organ.' It emits a profusion of small round cells, which may accumulate in considerable numbers under the free margin of the gum." (Smale & Colyer)

ADAPTED FROM SMALE & COLYER'S "DISEASES & INJURIES OF THE TEETH."



- a Alveolar process
- b Gingival margin
- c Dental ligament
- d Gingival organ
- e Alveolo-dental periosteum

A photomicrograph, by Dr. G. V. Black, of the gingival organ may be seen opposite page 185 of Mr. Hopewell-Smith's "Histology and Patho-Histology of the Teeth." Dr. Black says of this body "Its cellular elements are not epithelial, but are round connective tissue cells. These are in lobules, divided in part by delicate hyaline membranes."

Do we not see in this "gingival organ" a ring of protective lymphoid tissue, like the tonsillar tissue of the pharynx and fauces

Peyer's patches, etc., which on inquiry may admit pyogenic organisms to a not very resistant periosteum perhaps already weakened by constitutional malnutrition?

COURSE AND DIAGNOSIS

Chronic suppurative dental periostitis usually commences by a gingivitis at the gingival margin, either locally around one or more teeth, or as a general infection of the whole gum. The inflammation spreads to the alveolo-dental periosteum, becomes suppurative and of the type known as chronic, and it is this chronic suppuration of the alveolo-dental periosteum which constitutes the disease, as is shown by its resolution on removal of the tooth with its periosteum. The inflamed condition of the dental periosteum involves the bone of the alveolus as a rarefying osteitis, by which the socket of the tooth is gradually removed, the products of its destruction passing with the pus between the tooth and the gum margin, which becomes detached from the root to the level of the receded alveolus.

This rarefying osteitis may be regarded as the feature which distinguishes pyorrhoea alveolaris from other chronic inflammations of the dental periosteum.

The disease progresses slowly, sometimes continuing for many years, and may occasionally become arrested by improvement in health or by local treatment, but eventually the alveoli of all the affected teeth are destroyed, and the teeth are thrown off. The loss of the teeth at any time usually terminates the disease.

The process appears to be accompanied by very little pain until the teeth become sufficiently loose to give rise to general discomfort and tenderness on pressure. Occasionally neuralgic pain is present. A diagnostic sign of alveolar pyorrhoea in the early stages is, according to Goadby, hæmorrhage from the gum margin. The first symptoms noticed by the patient are as a rule an unpleasant taste, and "bleeding of the gums."

Magitot, who studied this disease, remarks "The age at which this affection is generally observed is not either in youth or in advanced age, but between the thirtieth and fiftieth years. It is equally frequent amongst men and women."

ETIOLOGY.

Authors have written of "conflicting" and "mutually excluding" theories of the causation of pyorrhoea, so it may be as well to state clearly what is here meant by the expressions used.

Alveolar pyorrhoea consists in chronic suppuration of the alveolo-dental periosteum and the vascular bone which it covers.

Suppurative inflammation is the reaction of the tissues to the activity of pyogenic micro-organisms. This activity, therefore, is the immediate or exciting cause of the suppuration,

and is intimately bound up with our concept of the disease.

The predisposing cause may be regarded as twofold,—lowering of the systemic resistance, and admission of the bacteria.

In the case of an organic disease of which chronic suppurative dental periostitis is a symptom, the organic disease constitutes the whole predisposing cause, firstly, by its debilitating effect on the system; and, secondly, by local injury resulting from the toxic conditions induced by it,—that is to say, by the action of its particular poison as a local irritant it exposes the dental periosteum to attack by pus-forming organisms, ever present in situ.

A predisposing disease, of which pyorrhoea is not actually symptomatic, acts by lowering the resistance, nutritive or opsonic, of the system. This lowered resistance, for reasons already given, readily affects the dental periosteum. In this case no pyorrhoea can occur without a local (traumatic) injury.

A local injury, without the presence of any definite disease, is sufficient to bring about pyorrhoea, that is, to admit organisms, if the opsonic resistance happens to be sufficiently low.

LOWERED RESISTANCE.

The gum margin is always exposed to a certain amount of wear and tear, so that local irritation can never be regarded as entirely absent. With this proviso, alveolar pyorrhoea may perhaps be looked upon as a symptom of certain diseases, such as syphilis, recurrent malaria, diabetes mellitus, chronic nephritis, and possibly tuberculosis.

From a number of observations on this point I cite the following—

Dr. Seymour Stutch, in a paper read at Dublin in March, 1908, says, "Syphilis is a cause of pyorrhoea alveolaris, owing to the periostitis it has a tendency to set up." He also says, "In locomotor ataxia the teeth sometimes become so loose as actually to fall out, this being only what might be expected to occur owing to the trophic changes that take place in the bones of ataxic patients."

Dr. Stutch quotes Dr. Foster as saying that he "seldom saw a cause of consumption which was unassociated with pyorrhoea alveolaris."

Mr. Newland Pedley, writing in 1887, said "Pyorrhoea alveolaris is a common sequel of malaria in America." My own experience would lead me to expect the presence of pyorrhoea in persons subject to repeated attacks of malaria.

Dr. E. Magitot, writing in 1887, said of pyorrhoea, "In glycosuria this phenomenon is absolutely constant, and even constitutes one of the primordial signs of the morbid conditions." Dr. Magitot also regarded pyorrhoea as symptomatic of Bright's disease. Smale and Colyer say "Any disease which produces a general lowering of vitality, e.g., chronic nephritis, tubercle, etc., must be regarded as a predisposing cause."

Any state which induces general malnutrition will predispose to chronic suppurative dental periostitis. It is frequently met with in the rheumatic, and as a result of pregnancy, lactation, wasting illnesses, chronic starvation and chronic alcoholism.

Goadby cites chronic dysentery, spire, "and perhaps malaria" as predisposing causes, and states that it may occur after the exanthematous fevers, influenza, and typhoid fever.

Endarteritis obliterans is cited by Dr. E. S. Talbot as a factor in morbid conditions of the alveolar process, and especially in pyorrhoea alveolaris.

Both rickets and pernicious anæmia have been given as causes.

Mr. Newland Pedley, in the paper referred to above, said, "Young persons suffering from eruptive fevers are sometimes subjects of pyorrhoea alveolaris. Frequent pregnancies are a life source of the disorder."

He considered pyorrhoea to be essentially of constitutional origin, and remarks, "In man and in the lower animals it is found connected with wasting diseases and depressed conditions of the system. The local exciting causes may be of a very trivial nature. The weight of evidence tends to place pyorrhoea alveolaris in the category of bone diseases. The exposed position of the alveolar margin, and its intimate relation with organs of such feeble vascularity as the teeth, goes far to explain why it is this portion of the alveolus is first affected, and also the usual arrest of the disease by the removal of the teeth."

It may be as well, at this juncture, to differentiate the condition under consideration from gouty dental periostitis, as gout is often given as one of the causes.

Gouty dental periostitis simulates the absorption of alveoli in old age. There is little if any apparent suppuration, and little if any calculus. In exacerbations a mucoid discharge occurs. The exposed necks of the teeth are hypersensitive, as a certain amount of chemical erosion is generally present, and shooting pains are occasionally felt. This condition is probably entirely systematic. The deposition of urates is, however, disputed.

The articulation of a tooth is to some extent a joint, and gouty dental periostitis is probably of an arthritic nature. (Smale and Colyer)

The local conditions in *Scurvy* are symptomatic of that disease, and must not be confused with pyorrhoea alveolaris.

LOCAL INJURY.

Of local mutants, elimination of the poisons of specific diseases has been suggested above.

The most frequent local mutant present is *salivary calculus* or "tatar."

Tatar, it may not be out of place to mention, is a calculus precipitated from the saliva and deposited on the surfaces of the teeth.

"The formation of the calculus is due to the precipitation of the salts from the saliva, calcium carbonate and calcium phosphate, which are insoluble in pure water, but soluble in water containing carbonic acid gas. When the saliva reaches the oral cavity, the carbonic acid gas begins to pass out of solution and the lime salts to be precipitated." (Smale and Colyer)

On the upper teeth the deposit is chiefly parotid, and consists almost entirely of calcium carbonate. On the lower teeth it is chiefly sublingual and contains more phosphate than carbonate. It derives its adhesive property from the admixture of mucus. The deposit also contains bacteria and nutrient media in the form of food debris and epithelial scales.

Tatar rapidly deposited is soft in character and occurs in large quantities. When deposited very slowly it is much harder and exceedingly tenacious. It most frequently occurs at the back of the lower front teeth owing to their proximity to the opening of Wharton's duct and to their dependent position. The next most likely place to find tatar is on the buccal surfaces of the upper molars opposite to the opening of Stensen's duct.

The calculus usually begins to accumulate in the angular recess formed by gum and enamel at the neck of the tooth. Owing to the mucous secretion and mobility of the gum it does not adhere to that structure, but attaches itself to the rigid tooth-surface, being built out therefrom in a mass having a wedge-shaped vertical section. As fresh lime salts are precipitated the mass increases by addition to both of its free surfaces, the saliva obtaining access to the surface opposing the gum by capillarity. The tooth gradually becomes covered on all surfaces except those kept free by use, and the gum is pushed away from the neck of the tooth until the dental periosteum is exposed, still further accumulation naturally giving rise to irritation of that structure and exposing it to infection. Mastication and cleansing operations oppose, and disuse of teeth and dirty habits favour, the accumulation.

Amongst the poorer classes in England, but more so amongst the natives of India, the teeth, especially those in the lower jaw, are sometimes seen to be covered by a solid mass of tatar.

Certain subjects have a greater tendency than others to the formation of tatar. Smokers are said to be more liable than non-smokers, possibly because of excessive secretion of saliva. Dr. Stritch says "syphilitic patients are liable to the formation of large quantities of tatar around their teeth."

The tatar deposited is modified by association with a periostitic condition. A hard and dark variety is frequently found under cover of the pocket formed by the detached gum. Smale

and Colyer say, "The source of the deposit is not clean. It probably arises from abnormal secretion of the gingival organ in combination with the discharges from the marginal gingivitis." It has been termed "serumic calculus."

Other local irritants are—dirt, friction, food, etc., wedged between teeth, improper use of tooth-brush, tooth-pick, etc., the sharp edges of carious cavities, rough edges of fillings, cap crowns, application of rubber-dam, wedging, etc., badly made bridges, ill-fitting dentures, regulating appliances, etc.

Amongst local irritants must also be included the products of micro-organisms.

BACTERIOLOGY

Researches have been made into the bacteriology of alveolar pyorrhoea by Malassez, Galippe, Arkovy, Miller, Black, Kulk, Goadby, Hordei, and others.

Galippe came to the conclusion that the disease was capable of transference, not only from tooth to tooth, but also from mouth to mouth. Arkovy described a streptococcus and a bacillus as probable causal agents.

The late Prof Miller, who made a series of very careful experiments, was unable to associate any one particular organism with the disease. He remarked on the small incidence of pyogenic cocci. Dr Hordei, however, finds *staphylococcus albus* and *streptococcus brevis* invariably present in the discharges.

It is Mr Goadby to whom we are chiefly indebted for the present position of the bacteriology of pyorrhoea. I have already referred to his accounts of his researches. He found in the pus from pyorrhoea pockets "an incredible number of organisms of widely different morphology." In the cultures made, "cocci of one sort or another, and always a streptococcus, may be isolated." His results show a much larger number of both organisms and species in pyorrhoeic pus than in other septic conditions of the mouth and gums, and he concludes that "alveolar osteitis is of complex bacteriology."

The diseases which most nearly approach pyorrhoea, in bacterial character are gingivitis and ulcerative stomatitis. Besides bacteria he finds yeasts associated with both ulcerative stomatitis and alveolar pyorrhoea. He says, "on the grounds of bacterial findings I am inclined to the view that the ulcerative stomatitis of children and the alveolar pyorrhoea of adults are the same disease."

The bacteria to which the serum of pyorrhoea patients most often reacts in Goadby's experiments conducted by the opsonic method of Sir Almroth Wright appear to be *streptococcus brevis* and *staphylococcus albus* and *aureus*, so for the present the opinion that the exciting cause of pyorrhoea is infection by ordinary pus organisms (perhaps modified by their habitat in the mouth) seems to be confirmed.

Goadby considers that many of the organisms found, especially the staphylococci and certain lactose-forming bacilli, can only obtain access to the gum margins from contaminated milk, and suggests that a milk diet, particularly in illness, etc., may be a factor in the causation of ulcerative stomatitis and alveolar pyorrhoea. With regard to the infectivity of pyorrhoea he "sees no other channel by which pyorrhoea can be spread except milk and dust."

Goadby says, "Pyorrhoeas are not all the same, and one finds that certain organisms are present in certain cases more than in others."

A line of observation has been suggested, having as its objective the possible diagnosis of the predisposing disease by the clinical character of the pyorrhoea. Would the nature of the pyorrhoea depend entirely on the infecting organism, or would the condition induced in the periosteum by a particular disease affect the clinical signs, or have any selective influence on the attacking organisms?

CONCLUSION

The question naturally arises, "Is it possible to indicate the true etiological factor in pyorrhoea alveolaris?"

I suppose the expression "true etiological factor" may be taken to mean that factor the elimination of which alone would suffice to prevent the disease.

Three factors have been referred to, predisposition, local injury, and micro-organisms. In the opinion of qualified observers the diseases and malnutritive conditions predisposing to pyorrhoea alveolaris are numerous and varied. Their causal relationship to pyorrhoea does not affect the consideration of their own prevention and treatment. With regard to micro-organisms, a considerable number of species may be causal. Any pyogenic organism that is capable of finding a suitable nidus in the exposed contents of the tooth-socket should be capable of causing the disease, and if these could be exterminated, others would probably become adapted to take their place. An aseptic condition of the mouth is impossible.

There remains local injury, and this is undoubtedly the weakest link in the chain. Without local injury the organisms could not obtain access to the debilitated periosteum. It would seem then that the first line of defence against pyorrhoea alveolaris lies in the integrity of the gingival organ.

An aspect of the etiology of pyorrhoea alveolaris to which I have not yet referred is *Susceptibility*. One cannot say that there is ever immunity to this condition, but one can recognise degrees of susceptibility. And those who show great susceptibility to pyorrhoea often exhibit a great degree of immunity to dental caries. This is, of course, an impression merely.

One has so often heard patients say "My teeth were perfectly sound, but they all dropped out one after the other."

It is possible that the nature of the discharges in pyorrhœa is deterrent to the organisms of caries, but it would also be an explanation if one could say that the susceptibility to pyorrhœa was "temperamental," and that persons of that particular "temperament" were immune to dental caries.

Besides individual susceptibility we can also undoubtedly recognise racial susceptibility, and it seems to be pretty certain that many Oriental races, and among them Tamils, Hindus, and Muhammadans, are considerably more susceptible to pyorrhœa than the Teutonic and Latin races for instance.

PART II—PYORRHŒA ALVEOLARIS AS IT AFFECTS NATIVES OF INDIA

In the great prevalence of pyorrhœa alveolaris amongst the natives of this country we have both a wealth of material for, and also an incentive to, the study of the disease.

The chief diseases, of which alveolar pyorrhœa may be regarded as a symptom, met with amongst natives, are perhaps syphilis, diabetes and malaria. Excessive local irritation is also very prevalent.

The special susceptibility, however, which appears to attach to Oriental races must, I think, be looked for chiefly in heredity and *the nature of the dietary*.

I am told that the agricultural classes of many of the rural districts of Southern India have very perfect teeth and that pyorrhœa alveolaris is almost unknown amongst them.

These peoples exist, as they have for many centuries, on an almost exclusively vegetable diet. Such a diet has become their natural one, and on it presumably the race has been built up. Their physique being good, one would not imagine that the natural and hereditary diet would predispose to periostitis of any kind. Still, it appears to be the case that races hereditarily accustomed to a soft vegetable diet are especially liable to acquire pyorrhœa alveolaris on injury of the alveolo-dental periosteum.

A marked contrast with these healthy cultivators is presented by the inhabitants of the big towns. In Madras, for instance, freedom from pyorrhœa would seem almost to be the exception rather than the rule. My own impressions would lead me to put down the cause to *change* in the conditions of life, mixed diet, *poverty* favouring malnutrition, and dirty habits.

Some remarks in a lecture delivered by Mr J H Danbei in January 1908, are of interest in this connection. He instances the Gauchos (a mixed race of Indian and Spanish blood) and Siwash Indians, as examples of,

exclusively meat-eating races who possess excellent teeth, and goes on to say, "I am told by Colonel Lee, of the Indian Medical Service, who has spent the greater part of his life in Southern India, of a very different condition of affairs prevailing there. There the native diet is almost entirely farinaceous, and the habit is prevalent of chewing the areca nut, which is mixed with betel leaf, with a small addition of lime and tobacco. The teeth of these people are generally in a foul condition, no attempt is made to remove the tartar, which accumulates in great abundance, and pyorrhœa alveolaris is common. . . Contrast the two pictures. On the one hand the hardy, meat-eating Gauchos and Indians with their perfect teeth, on the other, the feeble Madias, with septic teeth and neglected mouths, living on cereals, a constant prey to dysentery and allied diseases."

Mr J Howard Mumme, in a paper on dental caries in various races, also refers to the Gauchos, occupied in ranches and living mostly on horseback, as having very perfect teeth, and says, "In Indians of the same race inhabiting the towns and indulging greatly in artificial diet (acid confectionery, inferior wines, etc.), dental caries was extensive."

This latter statement would hold good in a slightly modified degree for the poorer classes in Madras City, among whom dental caries is quite frequent, whilst in the better nourished natives coming from the districts it is rare. If dental caries is frequent, however, in the Madras town-dwellers, pyorrhœa alveolaris is almost universal.

With regard to the incidence of pyorrhœa on other Oriental races I have no references handy. I believe, however, that it is very common in the Europeanised port towns in China and Japan, for instance, Hongkong, Shanghai and Yokohama. Its frequency in Japan would appear to be indicated by the accounts one reads of Japanese dentists, who extract teeth with the unaided fingers.

The teeth of the original inhabitants of tropical countries obviously differ in molecular constitution from those of the more civilised races living in temperate climates. They are generally larger, better formed, much more regular, and much less susceptible to injury by the products of micro-organisms. The teeth themselves differing in physiological properties, one would infer physiological differences also in a structure so intimately related functionally as the alveolo-dental periosteum.

I have referred above to the immunity apparently enjoyed by Oriental races to dental caries. As the natives of India evince a racial immunity to dental caries, so they may be said to have a racial susceptibility to alveolar pyorrhœa.

Before the actual disease can supervene, however, one or more of three conditions must be present, there must be a change of environment,

a condition of systemic malnutrition, or a local irritant.

1 *Change of environment*—The natural conditions of life for a native of India may be said to be—a simple, outdoor existence (the population is mainly agricultural), an almost exclusively vegetable diet, and few restrictions on the operation of the law of "The Survival of the Fittest"

These conditions have undergone a considerable alteration in recent times. Under European government the population tends to increase rapidly and to outstrip the means of subsistence, and the nature of the dietary has to some extent changed, the consumption of nitrogenous food-stuffs being much larger than formerly.

A diet of rice or *raghu*, the sort of soft food to which these people have been accustomed from time immemorial, requires a considerable amount of mastication and insalivation, a great quantity being necessary to supply the needs of the tissues.

This should produce good development of the masticatory apparatus. On the other hand, very little actual pressure is exerted on the teeth compared with that necessary for the breaking up of the roughly ground baked cereals and cooked or uncooked flesh which constitutes the diet of a large proportion of the population of Western countries.

There must be a difference in the functioning of the alveolo-dental periosteum, the tissue which has to take this pressure, between races eating soft foods and those eating hard or tough foods. It may be suggested that this difference has arisen by the persistence of variations stimulated by the cumulative influence of limited functioning on the germplasm, for it must be recognised that this influence has affected the whole race for many generations, perhaps since its origin.*

Besides this mechanical factor differences in the food ingested must give rise to differences in metabolism which may also affect the alveolo-dental periosteum.

A considerable number of Oriental peoples are passing from one phase to the other, and I would suggest that this fact may possibly help to account for their especial predisposition to chronic dental periostitis.

2 *Systemic malnutrition*—The presumed innate susceptibility of Orientals to chronic inflammation of the alveolo-dental periosteum may be aggravated by inappropriate or defective nutrition. I refer above to the condition of

chronic semi-starvation to which large numbers of the poorer classes in India are subject as a predisposing cause of pyorrhoea alveolaris. A large proportion of the natives who attend the dental department of the Madras General Hospital are poorly nourished. This condition of course also tends to weaken their resistance to specific diseases and other wasting illnesses, which are also predisposing causes.

Dr. W. H. Pease, who had much experience among the natives of Northern India, in a paper which appeared in the *Indian Medical Record* for September 1905, speaks of the "somewhat vitally-exhausted and fever-saturated native of India," and remarks, "no one can have mixed much with the natives of India without seeing that their whole being and vitality is on a lower scale than are the vital energies of Western nations." With regard to diet he says that, owing to the great poverty prevailing, "for long ages the race in India has been fed on too monotonous a diet, and that diet too small in quantity."

He concludes that *general lowered vitality*, due to long residence in a tropical or sub-tropical climate, and to long subjection to deficient and not sufficiently varied diet, lies at the root of the exceptional predisposition of Indian races to such conditions as fever, diarrhoea, dysentery, flatulence, anaemia, early "arcus senilis," liability to ulcers from slight wounds, and even to cholera and the scorbutic diathesis.

Altered metabolism, such as would be induced by excess of nitrogenous foods, spirit-drinking, unhygienic conditions of life, and so on, may also imply malnutrition.

It is possible that meat-eating races may be practically immune to pyorrhoea, as meat is their natural diet. If they were to take to a vegetable diet, they also might suffer. I have read somewhere that "vegetarians" are more liable to pyorrhoea alveolaris than persons accustomed to the usual mixed diet.

The prevalence of pyorrhoea amongst the citizens of the United States has been said to be due in part to excess of meat in the dietary, and to the hurry and strain of modern life. The latter cause may also affect the better class of Hindus, though the "strain," from our point of view, may be comparative only.

3 *Local irritants*—In a system predisposed to this affection, perhaps partly by an induced "vulnerability of the protective epithelia" (Microscopic investigation of the "gingival organ" in natives might yield interesting results), a very slight local injury may be sufficient to induce it. Amongst natives, however, the gums are often subjected to very severe irritation. Tartar, as I have before mentioned, is very frequently found, and owing to the use of food-stuffs which require little mastication and to the absence of effective cleansing methods, often accumulates in large quantities.

* "There is general agreement that inborn variations—which give every organism its individuality—are the expression of changes in the intricate architecture of the germ plasm. It is suggested that they are due (a) to the influences of the environment 'body,' with its variable nutritive stream, on the germ cells, (b) to the intricate permutations and combinations preparatory to and implied in fertilisation and (c) perhaps to what may be called growth changes in the germ plasm as it is continued from generation to generation." ("Heredity," J. A. Thomson, 1908)

The chewing of *pan*, owing largely to the *chunam* which it contains, and partly to its accumulating between the teeth, acts as an irritant to the gum margins.

In the rural districts, and amongst the Brahmin community, the teeth are thoroughly cleaned with a stick of "neem" or other wood, with or without some detergent preparation.

This is a very perfect method of cleansing the teeth and preventing the accumulation of tartar, and those who use this method are said to be free from pyorrhœa.

In the city of Madras, however, and probably in other big cities and the neighbouring districts, a very remarkable custom prevails amongst low caste Tamils, Pariahs, Mahomedans and Eurasians. It has its origin, perhaps, in attempts to clean the teeth in less time than the neem-stick method requires. The forefinger of the right hand is dipped into powdered charcoal or wood-ashes and the buccal surfaces of such teeth as are easily accessible briskly rubbed therewith in a horizontal or slightly oblique direction. This action is kept up sometimes for half an hour or longer daily. Its effect is to wear the teeth away, sometimes down to the level of the gum, and also to pack the charcoal, *debris* of food, etc., between the teeth.

As may be imagined, a considerable amount of this friction is taken by the gum round the necks of the teeth, and the insoluble charcoal together with food *debris*, etc., is wedged down between the teeth and inside the gum margin. Despite this tooth-destroying ritual, these people are dirty in their habits, and no attempt is made to remove the deleterious accumulations from between the teeth.

Another source of gingival inflammation is to be found in the pungent condiments frequently indulged in.

The stomatitic conditions often seen, especially in children, generally involve the gum, and may lead to dental periostitis. Ulcerative stomatitis is very frequent in the children (*v* Goadby's opinion).

Chronic suppurative dental periostitis tends to spread from tooth to tooth and is aggravated by what appears to be the chief operation performed by native dentists. This consists in wiring the teeth already extruded to the neighbouring comparatively sound teeth. The teeth which have been cut off by pathological processes are thus retained and made to keep up the source of irritation and infection. The ends of the wire used are usually bent down into the gum and have been known to cause fairly copious continued hæmorrhage.

No investigations, so far as I know, have been made into the bacteriology of the subject in this country, so that one cannot say if the bacteriological conditions differ in any way from those obtaining in Europe.

A PRELIMINARY NOTE ON SPIROCHÆTOSIS IN SOUTHERN ARABIA AND THE MORPHOLOGY OF THE PARASITE

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(1) INTRODUCTION

"THE ARAB CARAVAN BRINGS BUGS" A fact crudely recognised by the inhabitants of the many countries through which Arab traders travel, would lead one to expect that their mother country should prove no exception to the rule. Arabia, however, is a land where ticks swarm alone along its low lying fringe. In the high lands these acarids abound only along the big caravan routes, serais and the secluded wadis set apart by camel traders.

As Medical Officer to the Anglo-Turkish Boundary Commission opportunities were constantly afforded for noting the geographical distribution of disease in British and the adjoining Turkish Southern Arabia. One of the interesting facts noted was the presence of an undoubted spirochætosis in certain districts. Further the fact that it was almost invariably seen in new-comers to the country and occurred where these had entered a tick ridden district and encamped thereon.

(2) OCCURRENCE OF SPIROCHÆTOSIS IN ARABIA

Tick fever was not seen in the Dthalla valley, the Jilaf and other districts in spite of the fact that myriads of ixodes of a species to be described later infested the camps and specially the area where the Bosesa-camel contractors collected their animals.

On entering the Mudariba district and at the camps of Sanawi, cases of Spirochætosis were seen for the first time.

Men attached to the Commission escort presented a type of fever resembling somewhat that due to infection with *S. Duttoni*.

Further it was of interest that here the camp was infected with a tick to be described later of the ornithodoros group. Haushabi and Subahi Arabs state the ornithodoros tick under later discussion attacks human beings especially at night in dry sandy districts.

(3) SYMPTOMATOLOGY OF DISEASE.

The points of interest in the symptoms of such cases are The short incubation period. The headache and boneache together with the enormous cedema at the site of the bite, the intense prostration, lack of mental activity, increase in the size of the spleen, terminal copious greenish diarrhoea followed by a slow return to comparative health.

Local persistent discoloration at the site of the bite in some cases. The presence of a heavy infection of the blood with spirochætes.

A few cubic centimetres of human blood from two cases were withdrawn and injected intraperitoneally into young bush-tailed rats locally

known as Geibun. Such of these animals as lived under the severe conditions of camp life presented spirochaetosis with enlarged spleen. Several tame coneys were similarly made the subject of experiment but they escaped. Blood was also injected into two chameleons and a spiny tailed lizard, the latter showed no infection.

In blood films taken from the human patient typical spirochaetes (figs 29-30) alone were seen, singly or in pairs joined by a fine medial cytoplasmal band, the termination of the spirochaetes are pointed and stained faintly. Occasionally the paired spirochaetes showed an unequal number of plications in their length, two main types of spirochaetes were seen, one with scanty, wide and irregular plication, the other in which this was regular, shallow and more numerous. See Figs 29-30.

Fig 1. Spirochaete presenting about its centre a globose thickening the cytoplasm sheath encloses a large oval body staining deep purple, to which a fainter staining pointed mass is connected.

Fig 2A. Spirochaete presenting similar thickening but no fainter staining mass. The organism passes beneath a red corpuscle.

Fig. 2B. Bipolar oval bodies staining deep carmine at each end.

Fig 3. Spirochaete presenting about its centre a deep purple staining body and at one end a similar one enclosed in a sheath connected with the cytoplasm of the organism.

Fig 4. Spirochaete presenting a pyriform deep purple staining body about its centre with no definite cytoplasmal sheath.

Fig 5. Similar to No 4 only larger and with evidence of sheath.

Fig 6. Similar to No 5 but with a more definite sheath of cytoplasm.

Fig 7. Spirochaete lying between two red corpuscles presents a definite oval cytoplasmal vesicle about its centre, within the vesicle lie two oval carmine staining bodies of equal size arranged at opposite ends of the vesicle No 1 A and No 1 B. A large oval body staining bluish purple No 3. This body presents an area staining deep bluish black No 2.

On the shorter limb of the spirochaete are two oval carmine staining bodies that nearest the vesicle staining the darker of the two.

Fig 8. Two spirochaetes crossing each other. The shorter presenting at one end and the other three bodies with cytoplasmal sheaths similar to those figured in No 3.

Fig 9. A large faintly staining pyriform vesicle presenting two spirochaetes terminals. Within the vesicle occur two oval bodies similar in size and staining properties to those depicted in Fig 7 No 1 A and No 1 B. A large oval bluish staining body No 2 resembling Fig. 7 No 3. Two unequal vesicles pyriform in shape.

An oval body No 4 staining more faintly carmine than No 1 A and No 1 B. A small oval

body No 3 B staining the same depth of carmine as No 4. A long marginal carmine coloured body No 3 A connected with one spirochaete terminal and adjoining at one end No 1 A. A faint carmine colour strand seems to connect 1 A with 2.

Fig 10. Two spirochaetes. One of which a pyriform vesicle similar to that in Fig 9 is seen, this vesicle presents two oval carmine bodies 1 A, 1 B, bluish staining oval area with deep staining centre No 2, two vesicles of unequal size. From one spirochaete terminal in connection with this vesicle, a carmine staining body continuous with the spirochaete and presenting a deeper carmine staining spot enters the margin of the vesicle 4 B. A similar staining mass in connection with the second spirochaete terminal enters the opposite end of the vesicle 4 A. This carmine body bifurcates, the external fork showing a faint strand connected with 4 B. The internal fork presents a globose more deeply staining area adjoining a vesicle and showing a faint line of connection with No 2.

The second spirochaete presents a body staining similarly to the internal fork of 4 A, and would seem to be connected by a faint band of cytoplasm with the adjacent vesicular margin. There is no definite line of demarcation between the spirochaete terminal 4 B and the length of the second spirochaete running in the same line.

Fig 11. Two spirochaetes of unequal length presenting a seeming point of fusion, at this point an oval carmine staining body No 1 exists. Two similarly staining bodies arranged in a bipolar manner within a vesicle formed by the cytoplasm No 2.

Fig 12. A spirochaete presenting about its middle similar structures to those occurring in Fig 1. Along side the longer half of the spirochaete is opposed a bipolar body similar to those in Fig 2 B.

Fig 13. A spirochaete presenting structures similar to those in Fig 1 also at one end an oval carmine spot 1.

Fig 14. A spirochaete similar to that in Fig 1.

Fig 15. A spirochaete adjoining a red blood cell presenting a vesicle about its centre containing two oval carmine staining bodies 1 A, 1 B. A similar carmine smaller staining body 4. Two unequal sized vesicles bluish irregular shaped area 2.

All similar to those in Fig 9. On one terminal of the spirochaete a carmine coloured body fusing with the core of the spirochaete 3 A similar to that seen in Fig 9. On the other terminal of the spirochaete an oval carmine staining body 3 B similar to that in Fig 9.

The centre of the purplish mass No 2 is deeply stained.

Fig 16. A spirochaete presenting most of the details figured in Fig 15.

The carmine body 1 A is round and much larger than 1 B.

The carmine body 3 A is bifurcated as in Fig 10, 4 A

Fig. 17 A spirochæte presenting a vesicle similar to that shown in Fig 13, but presenting two oval carmine bodies 4 A, 4 B also two fainter staining carmine bodies 1 A, 1 B

Fig 18 Two spirochætes arranged in a Y-shaped way, and connected together by a central short portion

This connecting portion presents a terminal carmine staining spot and a smaller oval carmine body at the point of fusion. The two spirochætes present great broadening in several of their plications. On the shorter spirochæte a large oval and a lesser bodies occur, staining deep carmine. Six similar bodies are seen in the plications of greatest breadth on the longer spirochæte

Fig 19 A large clear faintly staining vesicle to which two tangled spirochæte terminals are connected

The vesicle presents a purple blue staining body 2 but smaller to that figured in Figs 9, 10 and 16. This body lies within an irregular faintly staining vesicle whose margin presents 3 fine carmine dots

Two oval carmine staining bodies 1 A, 1 B, similar to those depicted in Figs 7, 9, 10, 15, 16, 17.

Fig 20 Faintly staining vesicle presenting two clear vesicular areas. A large oval body staining pale carmine presenting 8 carmine staining bodies

Fig 21 Round vesicle presenting a reniform internal area lightly staining. Two unequal carmine staining bodies 1 A, 1 B, similar to those in Fig 16, four clear vesicles areas, four carmine staining dots arranged in a diamond, connected with each other by four staining bands enclosing a clear area

Fig 22 A round vesicle presenting two unequal spirochæte terminals 5 oval equal vesicular areas adjoining two of which are two carmine staining bodies 1 A, 1 B, similar to those in Fig 9. On one side of the vesicle is a cytoplasmal protrusion, containing a body 2 staining purplish blue with a darker centre similar to that depicted in Figs 9, 10, etc, within the shorter spirochæte terminal a carmine staining dot 4 A is seen

Fig 23 A round vesicle faintly staining containing six pairs of vesicles, and 3 small carmine staining bodies

Fig 24 A large faintly staining vesicle and two smaller ones, the largest vesicle presents a purple blue body, 2 two carmine staining bodies 1 A 1 B in oval clear area with bipolar arranged carmine staining dots

The smallest vesicle presents similarly 2 carmine staining bodies, 1 E, 1 F, in connection with the latter is a carmine staining body of the same breed, the average spirochæte enclosing a clear area, to one side of which a purplish blue staining body 2 A lies,

The third vesicle presents two similar carmine bodies 1 C, 2 B, and a similar shaped body 1 D, as in the 2 A just described

Fig 25 A spirochæte presenting a globose enlargement of the cytoplasmic sheath about its centre, within this there is a deep staining oval aggregation of the chromatic nuclear core in connection with that within the normal plication of the spirochæte, and at one end of the vesicle an oval carmine staining body 1 A

Fig 26 A faint staining vesicle, presenting an irregular shaped fainter staining area on the margin of which lie a large purplish staining mass 2, connected by a fine chromatin staining strand with an oval carmine staining body 1 C and two similar but smaller bodies 1 A, 1 B

A large oval clear area adjoining 1 A

Fig 27 A spirochæte presenting about its centre a vesicular enlargement of the cytoplasm containing in an oval body staining purplish blue upon which the oval carmine staining bodies lie

There is evidence of bifurcation of the chromatic core of one spirochæte terminal on entering the vesicle

Fig 28 A spirochæte adjoining a red blood corpuscle, and presenting about its centre a vesicular cytoplasmic small enlargement, containing an oval body 2 staining purplish, on one side of which lies an oval carmine staining body 1 A, connected with a similar body 1 B, at the periphery of the vesicle, by two fine chromatin staining strands. Evidence of bifurcation of one spirochæte terminal on entering the vesicle is seen

Fig 29 A typical spirochæte with wide irregular and scanty plication. Its ends are pointed and stain faintly

Fig 30 A typical spirochæte with shallow, regular and frequent plication, pointed and faint staining ends

Fig 31 A spirochæte presenting an eccentric vesicular enlargement of the cytoplasm

Within this vesicle lie a reniform purplish blue staining body with a deeper staining core 2. Adjoining and superimposed lies an oval carmine staining body 1 A, a second similar body 1 B. Adjoining 1 B an oval clear area lies at the periphery of the vesicle, a second smaller vesicle is also seen

Bifurcation of the chromatic core of both spirochætal terminals on entering the vesicle, and the connection of one with the purple blue core of the reniform mass 2 is shown

Fig 32 Three spirochætal terminals connected with an irregular shaped cytoplasmic vesicle and presenting the component parts noted in Figs 9-10

This form indicates fusion of a typical spirochæte with a second in the condition figured in Figs 15, 16, 33, 34, 36, etc, and an interchange of elements

The one terminal presents a faint staining sheath-like point, the chromatic core after

entering the vesicle and passing in the direction of the faintly staining shortest terminal, present a small oval carmine staining body 4 B

The second terminal presents a similar faint staining pointed sheath. Half way between the terminal point and the point of junction with the vesicle this terminal presents a small vesicular enlargement containing two small round carmine staining bodies, joined by a fainter staining chromatic strand with an angular bend about its centre. On entering the vesicle the chromatic core of the terminal bifurcates, one bifurcation terminating in a carmine staining body 4 A, the other bifurcation is connected with a large oval body staining purplish blue having a deeper staining core of an indefinite oval shape 2. The vesicle contains two large and one smaller clear areas between the large pair lies an oval carmine staining body 1 D, connected by chromatin staining strands with two smaller bodies, also adjoining these clear areas 1 A, 1 B. One of these bodies shows a faint indication of a chromatic strand connected with the carmine staining body 4 A.

Faint indication of sub-division into two equal masses are seen in 1 B. A similar subdivided carmine body 1 C, 1 E lies below 1 B. Three faint chromatic strands connect 1 B to 1 C, one strand adjoining the smallest clear area. A further chromatic strand connects 1 A to 1 C.

Fig 33. A faint staining spirochæte presenting about its centre a pyriform vesicle containing a deep purplish staining body 2, two oval carmine staining bodies 1 A, 1 B, connected with it by faint carmine staining strands. A nipple-shaped protuberance from the purple staining mass is directed towards two oval clear vesicles.

On one spirochætal terminal a pair of bipolar bodies similar to those depicted in Figs 11, 32, 35 are seen. A third bipolar staining oval body similar to those described in Figs 28 is seen attached by one end to the spirochætal terminal.

Fig 34. A spirochæte presenting features similar to 10.

Fig 35. A pair of spirochætes presenting almost exactly the details described in Fig 32.

Fig 36. A spirochæte of a similar type to that in Figs. 31, 34, 33, 15, 9.

Fig 37. A spirochæte comparable to that in Fig 15.

Figs. 38 & 39. Trypanosome Lewisii dividing forms stained and drawn under the same conditions as the previous figures of spirochæta, similar details of construction are common to both.

Fig 40. The scale to which the various figs have been drawn.

The life history of spirochætes in their various hosts have been under discussion for many years. Studies on the morphology have led to two distinct views being held, first, that they are of the nature of bacteria, second that they are protozoal organisms.

Holding the view that we have insufficient evidence in favour of the bacterial nature of spirochætes, one has considered these as a class of protozoa whose life histories have not been discovered. As many of the spirochætes examined from the heart blood of the bush rats made the subject of experiment, showed conditions differing from those of hitherto described members of this group, one considers that the organism under subsequent discussion is a spirochæte possibly of a new variety, further, that the peculiar morphological variations from the type spirochæte that have been noted in this organism present appearances which seem to suggest a sexual cycle in this particular organism, and may further be subsequently noted in others of this group. All these figures have been stained and drawn under similar conditions, namely, Zeiss apochromatic 1/12 with an 18 eyepiece, then magnification can easily be determined by comparison with the typical red corpuscles adjoining which some have been depicted. Each drawing has been kindly checked in detail by Captain Greig, Director, Research Institute, India, to preclude artistic error.

The key to the discovery of the many unknown stages in protozoal sexual cycles especially such as exhibit a destructive role towards man, lies in the recognition of the cytological phenomena known as the meiotic process and the application of these to protozoal zygosis. Comparison of the details described with those occurring in dividing forms of *Sip. Lewisii* drawn under the same condition of staining and magnification, show that it would be well to consider in all spirochætes the possibility of a definite protozoal cycle hitherto chiefly discredited.

4. GENERAL REMARKS ON CELL REPRODUCTION

The protozoal conjugation (zygosis) is dependent on fusion of nuclear elements (pronuclei) from two different individuals (gametes) the process (karyogamy) results in the formation by pronuclear fusion of a nucleus called the synkaryon.

Complete fusion of the whole bodies of both gametes results in the formation of the zygote.

This gametic conjugation may occur between adults of the species or between young multiplication forms and it may further occur between forms similar or dissimilar in size and structure, these processes being respectively differentiated by the terms microgamy, macrogamy, isogamy, anisogamy. In anisogamous conjugation such as would seem to be the case of the spirochæte under discussion, the microgamete or smaller active male differs markedly from the bulky less motile macrogamete female.

Maturation or preconjugal preparation of the nuclear substance for the act of zygosis by elimination of chromatin polar bodies is the rule adopted by protozoal gametes.

Further in anisogamous zygosis the parents of the gametes may differ from ordinary

individuals of the species. These parents are then differentiated usually into two kinds, microgametocytes and macrogametocytes. In the more highly differentiated protozoa regular alternation of generations occurs according as the sexual or vegetative cycles recur, further, the sexual and vegetative cycles may co-exist, for example, the polymorphic forms of these in malaria. Finally we find pathogenesis amongst Protozoa such as the Metazoa.

5 APPEARANCE MET WITH IN THE ARABIAN SPIROCHÆTE

Many important parasitic forms may be referred to the genus *spirochæta* and the organism under discussion seems undoubtedly to fall within this classification and to present evidence of vegetative and of what possibly may or may not be phases of a sexual cycle as seen in highly differentiated Protozoa.

Vegetative cycle—Multiplication by longitudinal fusion similar to that seen in *S. Ziemanni* by Schaudinn and *S. Duttoni* by me, is figured in this parasite. Thus arise the normal myriads of typical spirochætes the circulating premariotic spirochætes or vegetative cycle. Whether further longitudinal sub-division of these into minute forms visible only when agglomerated into rosettes occurs, or not, as was believed by Schaudinn in the case of *Ziemanni* and *S. Gallinarum* Prowazek (68) or as denied by Borrel and Lavean, one has been unable to determine. It is interesting and suggestive of the premariotic phase that we note under conditions of multiplication within a confined space such as within tick ova, that the spirochætes are found in spindle-shaped aggregations, then spirals for the most part lying parallel with each other throughout their length and it would be difficult to consider this peculiar phenomenon save on grounds of premariotic longitudinal division. The arrangement of the chromatin nodules within certain of the spirochætes, Figs 7, 9, 10, 11, 12, 13, 15, 16, 17, 19, 32, 33, 34, 35, 36, 37, together with the presence of free bipolar bodies similar to that occurring in *Duttoni* would lead one to suppose that these are phases of polymorphism of the parasite derived either from some final stage in the sexual cycle, or liberated during the vegetative cycle from the typical spirochætes or premariotic spirochætes, and the result of subsequent premariotic cell division. It is possible such minute indifferent forms on development give rise during the acute febrile stage, to the heavy infection of the blood with typical spirochætes of different length that occurs. It is worthy of note that at such periods pairs of spirochætes connected by a fine cytoplasmal band are common.

Examples of two forms noticed in this spirochætosis varying in their frequency of plication are shown in Figs. 29, 30

A Heterotype division in the spirochæte the primary malaric spirochæte—The typical spirochæte Figs 29, 30 presents a globose enlargement of the cytoplasm at one point. Fig 25. It is noticeable that this is situated more often about the centre of the length of the spirochæte, Figs 1, 4, 5, 6, 14, 25, than at one end. Fig 2A, 3. Within this cytoplasmic sheath appears a nucleus staining deep purplish red. Fig 25. This would seem to be an aggregation of the nuclear components within the cytoplasmic vesicle acquiring at the same time a closer chromatic reticulum, corresponding to the chromosome anlagen seen in the primary malaric phase of mammals. In Fig 17 (1A, 1B, 4A, 4B) we find what would seem to be four chromatic centres in connection with the remainder of the nucleus. In Figs 12, 13, 14 an oval achoplasmic spheric appears lying to one side of the nucleus and staining a deep carmine similar to that of the Negri bodies by Mann's long method. Later two oval carmine staining bodies are seen. Figs 7, 28, 37.

The next stage figured is that where two unequal clear vesicles appear and from their position it would seem they are in relation to the achoplasmic mass. Figs 9, 15, 16, 31, 33, 36, 37. Next a third small carmine similar staining mass is now seen. Fig 9 (4), a second may also occur within the vesicle and would correspond to the migrated centrosomes and their sub-division, as is seen in heterotype division.

In the final phase as yet figured in this stage the vesicle presents with its spirochætal terminals the above component parts, but in addition the chromatic cores of the terminals present evidence of bifurcation on entering the vesicle of interconnection by a marginally arranged chromatic strand and of a deeper carmine staining body either in their length or within the vesicle. Figs 9, 15, 16, 31.

The stage of the sub-division of the malaric cells into two daughter cells has not been met with, but it would not seem difficult to construct such from what is seen in the next series under consideration. Here we find what would seem fusion and interchange of elements between a daughter malaric heterotype spirochæte and the typical spirochæte which plays the potential role of a flagellate. It is worthy of note that within the vesicles in Figs 10, 32, 35 we find components so exactly similar to those found within division forms of *T. Lewisii* also drawn and stained under the same conditions. Figs 38, 39, 40, that it would seem undoubtedly that stages in the reproductive cycle have been depicted, these are to be the subject of further study. The role of the bipolar staining bodies and their relation to similar bodies noted in Figs 2B, 7, 11, 33 is also under consideration.

In Figs 19, 20, 21, 22, 23, 24, 26 to 37 we have bodies depicted strongly indicative of later stages in the sexual cycle but which are at present recorded without further discussion.

PLATE I

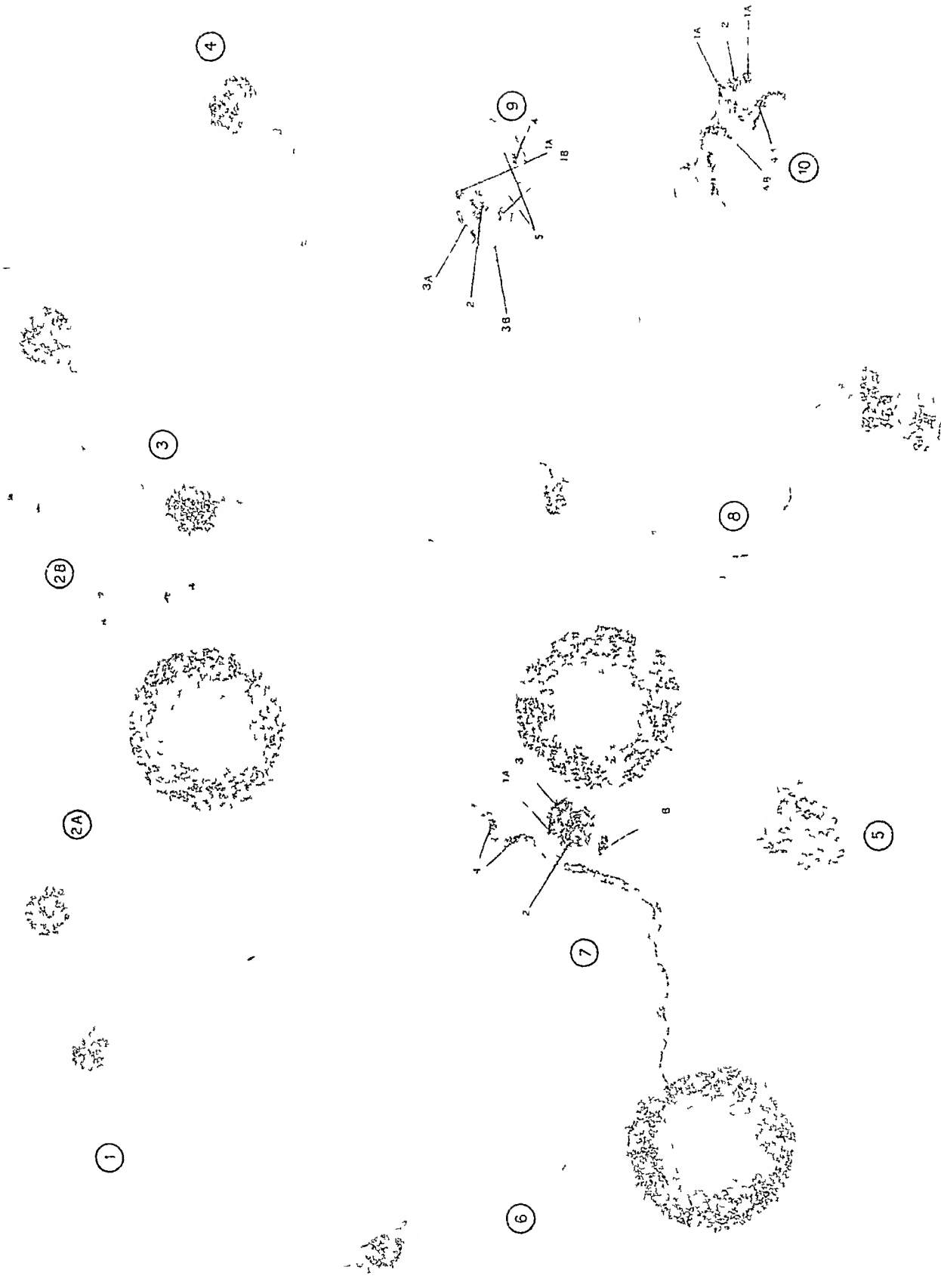


PLATE II

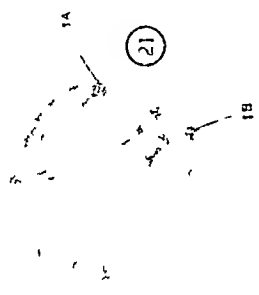
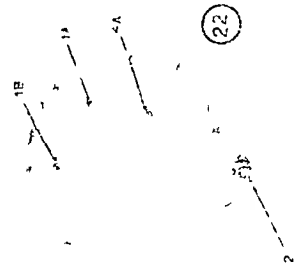
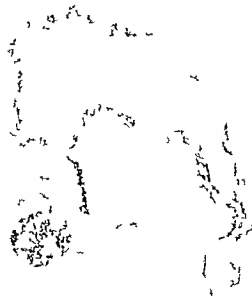
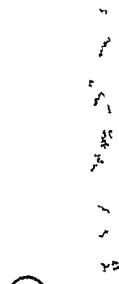
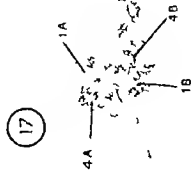
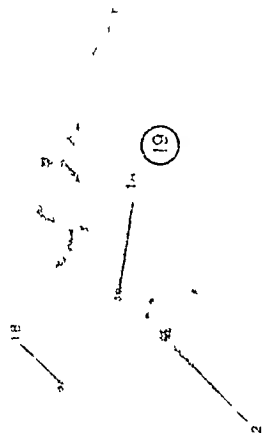
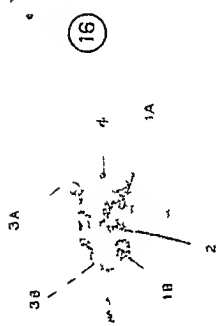


PLATE III

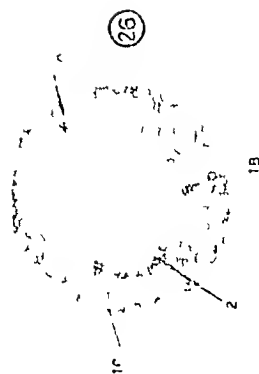
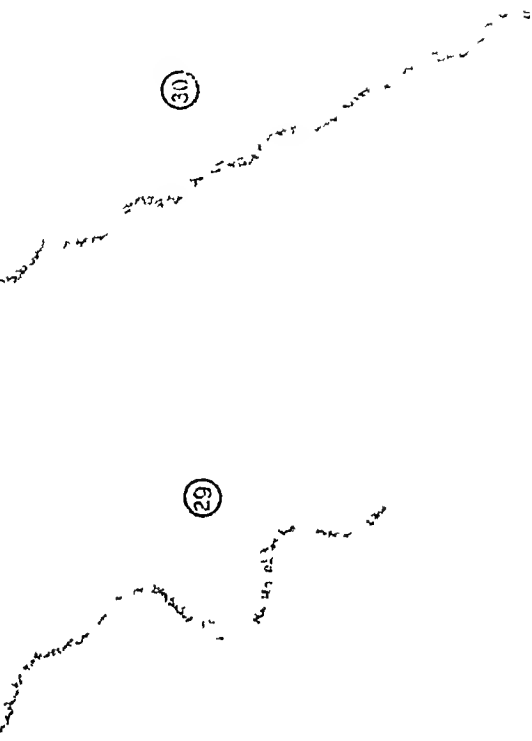
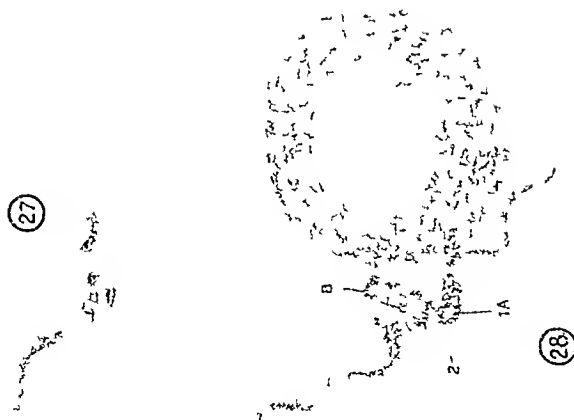
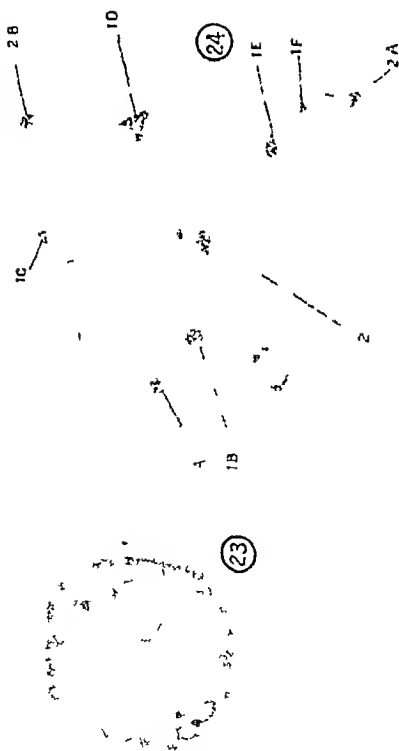


PLATE IV

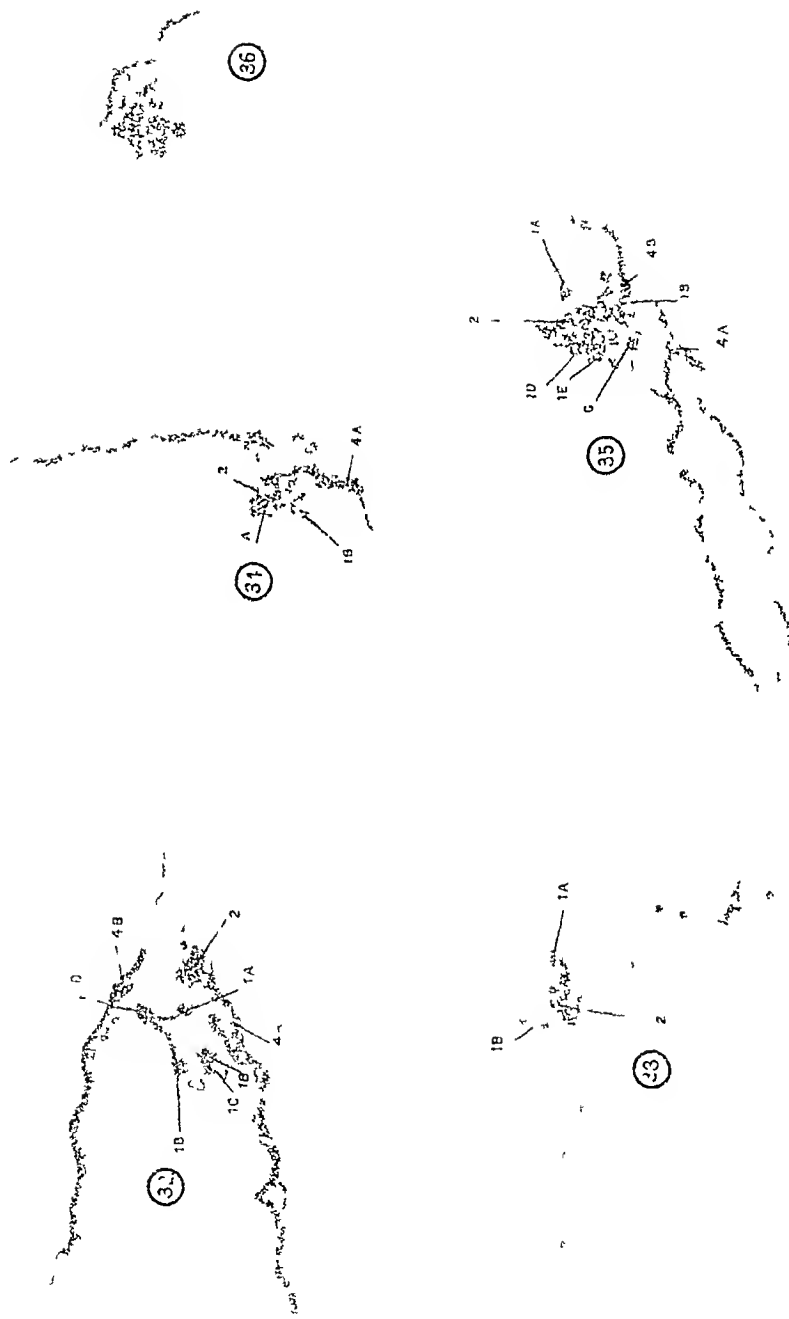
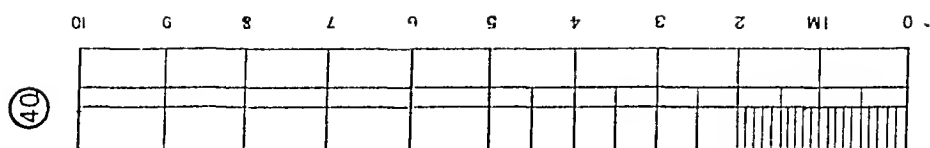
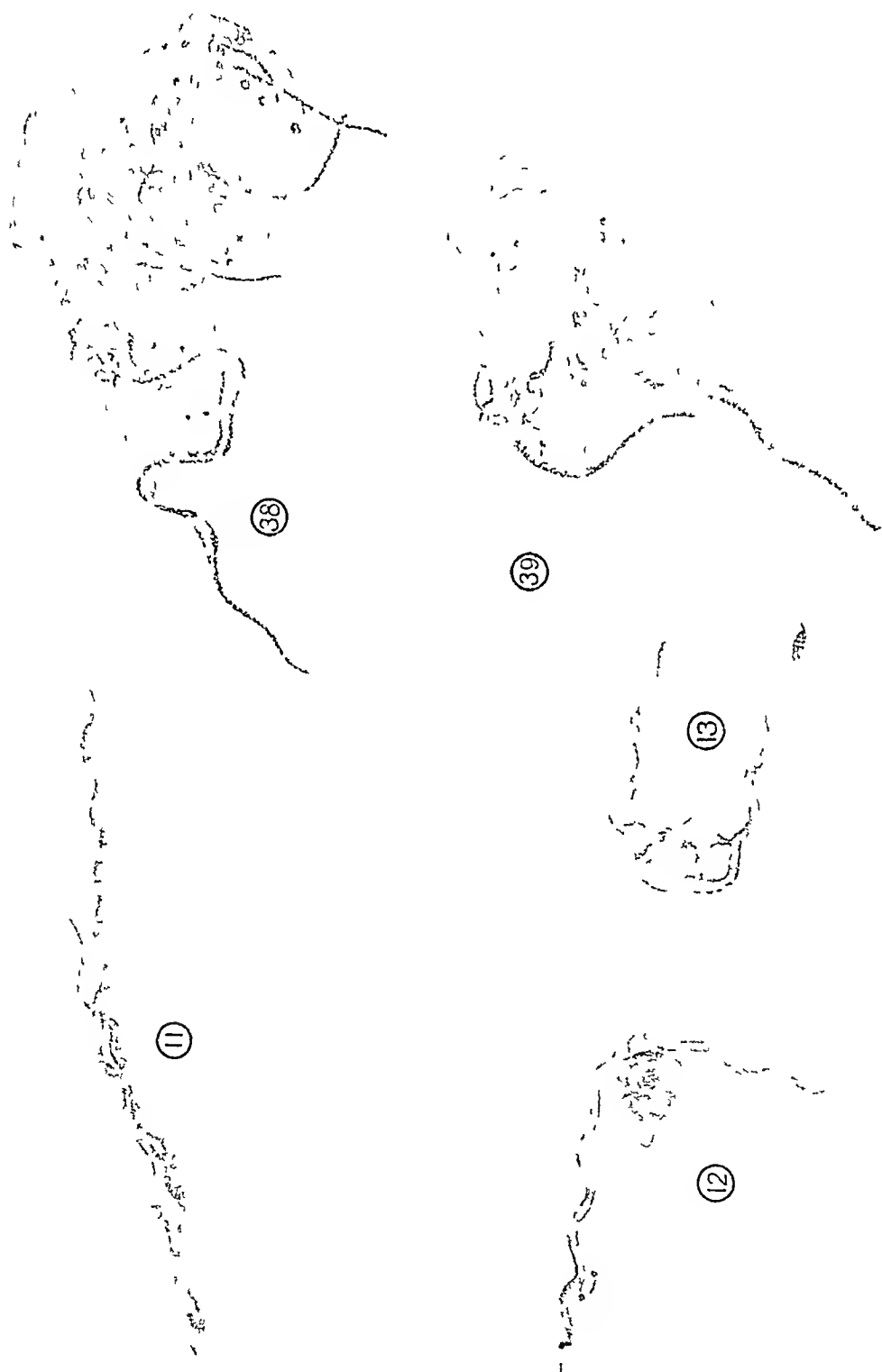


PLATE V



THE VALUE OF TAKING THE SPECIFIC GRAVITY OF THE BLOOD DURING SALINE TRANSFUSION IN CHOLERA

By E. J. O'MEARA, FRCS (ENG.), DPH (CAMB.),
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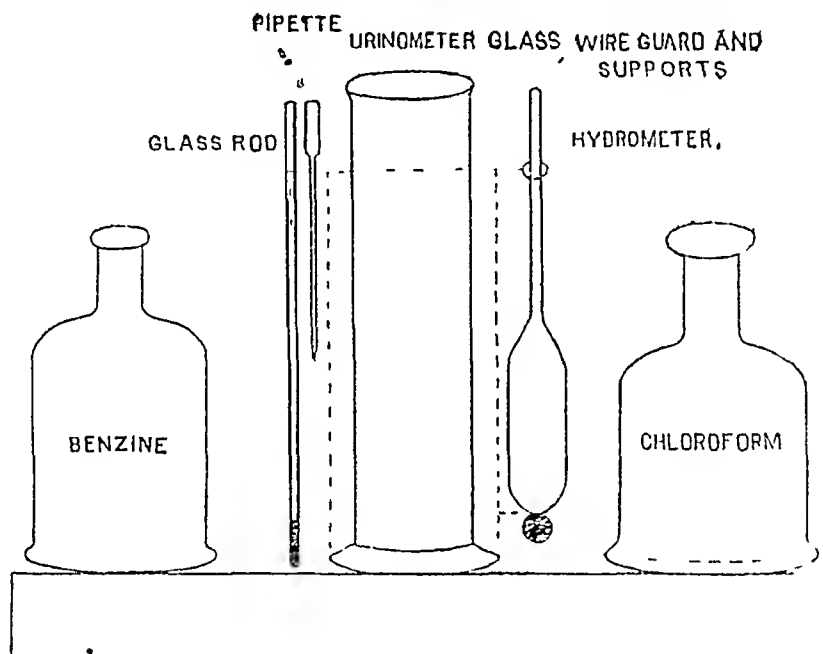
THE blood in cholera is profoundly changed in almost every conceivable way, chemically, physically, and microscopically. The alkalinity is much diminished, the coagulability is changed, cells and albumin are increased, there is a rise in the number of red-blood corpuscles and a corresponding rise in the percentage of hæmoglobin, but a serious diminution in the amount of oxygen, there is a leucocytosis.

The outflow of constituents is so great that the specific gravity is enormously increased (even to 1078), the outflow of the elements

with a 0.625 saline solution, a point is soon reached at which a flow from the blood into the intestine is again possible with the recommencement of watery evacuations as a result, and on this depends the fact that saline transfusion as usually performed is so often a failure.

If, however, the saline transfusion be given very gradually, and the specific gravity of the patient's blood slowly brought to the normal instead of being suddenly diluted, the endothelium of the vessels will have time to again take up the fluid which has been drained from its protoplasm and regain its normal function, then when the specific gravity of the blood has been sufficiently reduced, osmosis will recover its equilibrium, and the normal flow from the vessels into the tissues will be re-established.

The point I would especially urge is, that more accurate and better results can be obtained



appears to take place in a regular order, the water of the serum transuding before the solids, the inorganic before the organic solids, the chlorides before the phosphates, the salts of soda before those of potash.

There is a complete reversal of the normal osmotic flow instead of the normal absorption from the intestine into the vessels and from the vessels to the tissues, there is an endosmotic transit of fluid from the tissues into the blood vessels, and an exosmotic outflow from the vessels into the alimentary canal, hence the profuse watery motions and vomiting.

At the time that transfusion is generally performed this abnormal flow has ceased, not because osmosis has regained its equilibrium, but because the tissues have been drained dry, and the specific gravity of the blood has so increased that an effusion from the blood into the intestines has become a physical impossibility, if the circulation is now rapidly diluted

during intravenous injection of salt solution in cholera by examination of the specific gravity of the blood rather than by observation on the blood pressure for the following reasons —

1 The whole treatment of the disease turns on the increased specific gravity of the blood.

2 That an enormous quantity of saline may be transferred into the vessels without any marked rise of blood pressure.

3 The peripheral resistance is much increased in cholera, not only by changes in the endothelium of the vessels, but by chemical changes in the blood, diminution of oxygen, etc., even independently of the increased specific gravity.

4 That the blood pressure in cholera is liable to sudden and considerable variations apart from transfusion, which I am unable to explain.

5 That the blood in cholera being deficient both in water and salts, transfusion may

temporarily raise the blood pressure with fluid without increasing the specific gravity with salts

6 By transfusion gradually regulated by taking the specific gravity, the renal epithelium has a much better chance of recovering its function, and that, therefore, the present large mortality from uræmia will be considerably reduced, if not abolished, as I have not had a death from uræmia by this method

The most rapid and convenient method for ascertaining the specific gravity of the blood in cholera is that of Hammeischlag.

A urinometer glass is filled with a mixture of chloroform and benzene, having a specific gravity of about 1060, a drop of blood is introduced into the mixture by means of a pipette. If the drop of blood tends to rise towards the surface more benzene is added from a pipette and if it tends to sink more chloroform. By successive additions of chloroform and benzene a mixture is obtained in which the blood remains suspended without moving either up or down, when this point is reached the specific gravity of the mixture is taken with an accurately graduated hydrometer and the result represents the specific gravity of the cholera blood

The mixture should be kept stirred with a glass rod while the chloroform and benzene are being added. Benzene 40 cc and chloroform 20 cc give a specific gravity of 1063.0

The stand illustrated in the last page is constructed for taking the specific gravity at the bed side

The specific gravity in one of my cases was as high as 1078. The blood was so inspissated that it did not flow from the vein when opened for transfusion. The patient was a very small Bengali woman, could not have weighed more than $5\frac{1}{2}$ stone, but it was necessary to very gradually transfuse as much as $6\frac{1}{2}$ pints, she made an excellent recovery. I have now done this operation 29 times during the last $4\frac{1}{2}$ years with three deaths. Out of the three deaths one was from cerebral hæmorrhage on the sixth day, one was a very severe case and transfusion was too late, in the third case I was very pressed for time and transfused too rapidly, the patient passing urine within $2\frac{1}{2}$ hours of transfusion being commenced

As regards the time for transfusion, I never transfuse until the pulse has entirely disappeared from the wrist when it should be gradually commenced. From recent experience, however, I do not think this is a safe rule with European patients, and more especially with children, but I have always found it so with natives. Injecting saline fluid into the cellular tissues is nothing less than criminal. As if the patient really requires transfusion, the specific gravity of the blood is so high that the absorption of fluid from the cellular tissue is almost a physical impossibility, while on the other hand, if he is

able to absorb it he would do so more rapidly and effectively from the stomach or rectum if very small quantities are carefully administered at a time, but great care is required in this direction, as I have more than once seen a case of cholera in which fluid has been administered carefully and in small quantities by the mouth, but the patient was unable to absorb it, with the result that the stomach became over-distended, vomiting, sudden collapse, and rapid death resulting

The vitality is so depressed in cholera that there is the greatest danger of cellulitis from saline injection into cellular tissue, no matter how carefully the operation is performed, I have seen a case in which the whole of both axillæ and both groins sloughed out, and another in which the whole circumference of the thigh sloughed from the groin to the knee, and these cases are of course almost invariably fatal

In all severe cases that have required transfusion I am very against giving any food by the mouth for at least 72 hours, and in some cases I have not given it for five days and then only very gradually as the power of absorption of nutrients is not regained until long after the absorption of water. These patients, like infants with summer diarrhoea, will do quite well if fluid is not withheld, but sips of very dilute barley or boiled water are frequently given and they are kept warm

In cases seen early it is often worth while to wash out both the stomach and bowel with large amounts of sterile water, the long tube must be passed well up, and the can for the water held 3 feet above the bed, the patient being on a very large mackintosh and the buttocks raised on a bed-pan

I have read with much interest Major Leonard Rogers and Captain Maxwell Mackenzie's articles in the *Indian Medical Gazette* for May, and think that by the use of a hypertonic solution the period of transfusion might be considerably reduced, but am still of the opinion that the best results will always be obtained by allowing time for the endothelium of the vessels to recover itself and thus reverse the abnormal osmosis and by observations on the specific gravity of the blood rather than on the blood pressure

In a few cases of very severe pernicious malaria in which quinine has failed when given repeatedly by the mouth, rectum, hypodermically and even intravenously I have had remarkable results by transfusing $2\frac{1}{2}$ or 3 pints of normal saline solution containing 7 grains of the bihydrochloride of quinine, the temperature has fallen to normal within a few hours and remained down. The beneficial action of the saline solution appears to be the breaking up of certain red corpuscles, and allowing the quinine to act on parasites it was unable previously to effect

A Mirror of Hospital Practice.

THE TREATMENT OF UNCOMPLICATED LOBAR PNEUMONIA

By G. MCL SMITH

MAJOR, I. M. S.

In India, as in Europe and America, lobar pneumonia is one of the commonest of fatal diseases.

Unfortunately, no statistics are available to shew the actual mortality among the general population. Some idea of it may be formed from the mortality among native troops and prisoners. During the five years, 1902—1906, the mortality among the former averaged 2.5 per mille, and among the latter over 3 per mille. These are the figures for the whole of India. In some provinces they are considerably higher, e.g., among prisoners in the Punjab the mortality from pneumonia was, during the same period, 4.2 per mille. Both of these are classes of persons living under favourable circumstances, and it is not unreasonable to assume that the mortality from the disease, among the general population, is considerably higher.

The treatment of pneumonia is, therefore, a matter of great importance.

From the records available in a head-quarters civil dispensary, in the Punjab, I found that the case mortality was certainly 33 per cent, and more probably 44 per cent. The former percentage actually died in hospital, while the latter figure is arrived at, by counting as having died, those patients who were removed from hospital by their friends, during the course of the illness, which usually only occurs when the patients are moribund. During the years 1902—1906, the case mortality among native troops averaged 19.9 per cent, while among prisoners, during the same period, it was 24.9.

As the latter probably received the same degree of attention as the former, this difference must be attributed to the variation in the fatality of the disease among healthy adults, and a mixed adult population, respectively. The higher of these figures is very much below the mortality in the civil dispensary, but this may be partly due to the fact that some of the cases treated in the dispensary were admitted only after the disease had existed for some days. In any case, the mortality appears to be needlessly high, and I think that the methods of treatment adopted are, in some measure, responsible.

To enable us to arrive at a correct treatment, it is necessary to understand the pathology of the disease, and the indications for treatment it affords. The fundamental feature of the pathology of lobar pneumonia is that it is an intoxication. It is not essentially a disease of

the lung, any more than is diphtheria a disease of the throat. The nature of the lesion in the lung, its site and extent, are, if not absolutely immaterial, of very little importance, for the virulence of the causative organism, and the resulting degree of toxæmia, do not appear to be in any way related to the extent of the local lesion. We may, as far as we are concerned with the treatment of uncomplicated pneumonia, disregard the facts of pathological anatomy, and the physical signs, after we have arrived at a diagnosis. The exudate is of no interest to us, as it is not the cause of the disease, nor of any of its symptoms. We may regard it, and the physical signs to which it gives rise, as non-essential features of the disease, designed by a beneficent Providence, to enable us to make an early diagnosis of a disease that requires, in many cases, energetic treatment from the beginning. But too many of us have come to regard the exudate as more than this, and futile efforts are directed towards removing it, while the real enemy, the toxæmia, is ignored. The exudate is not expectorated, it is digested, absorbed, and excreted, mainly by the kidneys.

Yet how many of us devote our energy to the administration of expectorants—carbonate of ammonium, ipecacuanha, compound tincture of camphor, senega, etc., in varying proportion? I have even come across one practitioner, in this country, who treated his pneumonia patients with tartar emetic. Remembering the fate of the exudate, it is evident that none of these drugs is of the slightest use, even if the removal of the exudate were the object of our treatment, and many of them are positively noxious.

For, as stated above, the essential feature of the disease is the toxæmia. The toxin acts primarily on the cardiac and vascular centres in the medulla, which it depresses.

The evidences of this are the accelerated pulse, and, more especially, the falling blood pressure.

This latter is invariable in cases of profound pneumococcus toxæmia, and the failing circulation, which it indicates, is the immediate cause of death, in practically all fatal cases of pneumonia. Later, or more rarely from the beginning, the toxin may affect the higher nervous centres, the commonest evidences of this being delirium, either maniacal, or of the low variety, and muscular tremors. It is evident that our treatment should have two main objects—the elimination of the toxin, and the antagonizing of its effects. The former is not easy, but we may help, by providing abundance of fresh air, by promoting the action of the skin, by tepid bathing rather than by the use of diaphoretics, for these depress the circulation, and of the bowels, and more particularly of the kidneys. In this connection the observation of Professor Osler, that 25 per cent of his cases

that came to the *post-mortem* table shewed extensive chronic interstitial changes in the kidneys, is significant. Probably the plentiful supply of pure water is as efficient a means as we possess, of promoting the elimination of the toxin through the kidneys.

In combating the effects of the toxin, much can be done by means of drugs, and hydrotherapeutic measures. Death in uncomplicated lobar pneumonia is due to circulatory failure, and circulatory failure can be prevented, in many cases, by drugs.

Two drugs stand out pre-eminently as sustainers of blood pressure—digitalis and strychnine.

The action of these two drugs differs, the important point being that digitalis is very slow in its action, taking from two to three days to produce its full effect. In using it to combat failing circulation, it is essential that we should not wait for signs of circulatory failure to appear, but begin its administration on the first day of the illness. The drug is a safe one to use, and may be given in doses of $m \times$ or more of the tincture every four hours. It has the further great advantage of promoting the action of the kidneys, and so helping in the elimination of the toxin.

Strychnine acts rapidly, and there is not the same necessity for giving it in anticipation of the appearance of signs of circulatory failure. But there is certainly no harm in giving it too soon, so it may be given with the digitalis from the beginning in doses of $m \text{ iv}$ of the liquor strychninæ hydrochloridi, the dose being subsequently increased if necessary. Alcohol is nearly universally used in the treatment of pneumonia. There is no objection to its use, if it be given only when the combination of strychnine and digitalis appears insufficient to sustain the blood pressure. To give it as a routine matter, from the beginning of the illness, is unscientific and useless, if not actually harmful, inasmuch as it may delay the elimination of the toxin from the tissues. Expectorants are useless, and some are actively harmful, *e.g.*, the opium in the compound tincture of camphor, which hinders the elimination of the toxin, though occasionally, for the severe pain of a concomitant pleurisy, morphine may be necessary. Ipecacuanha is a circulatory depressant, and antimonium tartaratum still more actively so, and these two drugs are distinctly contra-indicated. There is less objection to the administration of ammonium carbonate, senega or squills, but some of these drugs tend to disturb digestion, and so far as their action on the circulatory system is concerned, they are inferior to digitalis.

The above considerations are theoretical. I regret that I have not a large number of cases to report in support of the theory, as I have not, until recently, kept any records of cases.

PROSTATECTOMY FOR RETENTION OF URINE

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LIEUT. COL., I.M.S.,

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I HAVE not seen many cases of the above operation recorded in India, the following case may, therefore, be of some interest.

Khaja Mogul, a strong healthy-looking Mahomedan, aged about 60, was shown to me one morning at the Afzul Ganj Hospital, Hyderabad, while I was acting as Residency Surgeon, he stated that for the last twelve months he had had increasing difficulty in passing water, and that twelve days before the date on which I saw him, he had been unable to pass any urine and had to come to hospital to have the urine drawn off two or three times a day. He was a very powerful, strong man, a field labourer, who could not remember ever having been ill, all his organs were apparently perfectly healthy, urine contained no albumen, but a slight phosphatic deposit. The prostate could be easily felt to be considerably enlarged, there was no stricture of urethra. I strongly advised him to undergo an operation, and to this he consented and was admitted to hospital.

He was admitted to hospital, April 3rd, bladder was washed out once a day with boric acid solution and he was given small doses of quinine and dilute nitric acid till the urine was perfectly clear.

On 13th April the prostate was removed in the usual way, an incision about 3 inches long was made over the bladder, which was distended with weak boric solution and a silver catheter kept in, when the bladder was exposed, two silk sutures were passed through the wall, and the bladder opened between them, the two sutures kept the lips of the wound separated. The prostate was found to be considerably enlarged, the lateral lobes were pressed together against the catheter, and it was this lateral pressure which caused the obstruction. There was no sign of an enlarged middle lobe, as can be seen from the illustration.

The mucous membrane covering the right lobe was scratched through with the nail of the forefinger and the finger worked round first one lateral lobe, then the other, and last the posterior part of the gland, it was by no means easy to separate out the gland, regular hard work, and very tiring to the finger. Capt. Burgess, I.M.S., and Assistant-Surgeon Abdul Hossain, had to take turns to help me. The whole gland was eventually separated and pushed back into the bladder and was easily delivered through the small opening in the bladder.

The after-treatment of the case was as laid down by Lt-Col. Freyer, a large rubber tube with two large circular holes at the end was introduced just through the opening in the

bladder wall, and retained in position by a couple of silk sutures, the tube was not pushed into the bladder, only just through the bladder wall, there was never any straining or discomfort of any kind



The catheter was removed and all urine was passed through the wound for the first 10 days, when a silver catheter, No 12, was easily passed and the bladder washed out with warm boric solution, he began to pass urine by the urethra on the 12th day of the operation, and on the 31d of May the supra pubic wound was completely healed and all urine passed by urethra

At the operation there was very little bleeding, and after the operation he never had a sign or symptom which gave me any anxiety. He can now pass urine in a large stream and expresses himself as highly pleased with the result of the operation

I have never had an opportunity of witnessing this operation before I operated on this case, but I was very careful to adhere strictly to all the directions laid down by Col Freyer, I was rather surprised at the difficulty I experienced in separating out the gland

The accompanying photograph shows the prostate after removal with a catheter passing through the prostatic urethra

ON THE TREATMENT OF SMALLPOX BY LARGE DOSES OF HYDRARG. C CRETA

By V B NESFIELD, F.R.C.S.,

CAPTAIN, I.M.S.

DR MOXON describes syphilis as a fever diluted by time. Of all the fevers, small-pox most closely resembles syphilis, especially in its acute secondary form

I believe that the acuteness of secondary syphilis can only be fully appreciated after one has seen that stage of the disease in India

The treatment in consequence has to be correspondingly vigorous; 5 grains of Hyd. cum Cret. thrice daily has very little immediate effect, but 10 grains thrice daily removes all obvious signs of the skin eruption in three to six days. In fact, mercury appears to act towards syphilis as quinine does to malaria, a certain sufficient dosage being necessary to abate the disease, and, until this dose has been reached, very little immediate relief is given. In view of the discovery of the *spirochaeta pallida*, there is nothing out of the way in this connection

The striking resemblance between acute secondary syphilis and small-pox suggested the employment also of mercury in the treatment of the latter complaint. Experience with syphilis showed that 30 grains of Hyd. cum Cret. per day for seven consecutive days, produced no diarrhoea, or symptoms of poisoning, but on the contrary gave such marked relief, that I decided to employ the same dosage also for small-pox

The results proved so very satisfactory that I have been tempted to describe them, although my conclusions are only drawn from the observation of eight cases

Of the eight cases, three had been vaccinated, and five had not. Seven were adult men and one was a boy of 12. All were natives of Oudh. The first case was the boy of 12, he was sent from a mission school on the first sign of the disease. His face, arms and legs were thickly covered with typical small-pox papules, which were present also on his scalp and the palms of his feet and hands. On the face the papules were so closely situated, as to be almost contiguous

No vaccination marks were present. The case could be described as a severe one. He was removed to the small-pox hospital (Lucknow), and given 5 grains of Hyd. cum Cret. three times a day for six days, then twice a day for the next four days, and once a day for the next 3 days

Sweet oil was used to soften the skin. The diet consisted of 4 pints of milk a day. The course of the disease, turned out to be very mild, though from the first appearances it threatened to be very severe, the temperature never rose above 103° F and reached normal on the third day, the papules did not suppurate and break down

There was no diarrhoea or sign of mercurialism. On discharge six weeks after admission, there were no scars, merely the usual pigmented patches seen in natives. The desquamation of the palms of the soles and hands was rather tedious

The remaining seven (six were sepoy) were typical cases of small-pox, all were more than moderately severe, and all were seen very early

The treatment in all seven consisted of 10 grains of Hyd. cum Cret. three times a day for six days, then twice a day for four days, and once a day for four more days—14 days in all

Sweet oil was used to soften the skin, no other medicine was given

The diet consisted of 4 pints of milk per day, and in addition 4 ounces of arrowroot and two of sugar, when the temperature reached normal

There was never any sign of mercury poisoning and no diarrhoea

The mercury seemed to have a marked influence in lowering the temperature, and in modifying the development and subsequent fate of the papules, in that, no active suppuration occurred, so that the disease was both cut short and simplified, leaving the patients in most instances free of all pits and scars (Two patients showed two small pits each, on the face)

In future I intend to further push the mercury during the first three days, as it is the immediate influence which is so necessary

From experimentation I find that the lethal dose of Mercuric Chloride is 1 in 1,000,000 (one in a million), in 10 minutes, for the B coli suspended in water in quantities of 2,00,000 per cc at a temperature of 98°F Also, that all things being equal, the lethal power of Hg Cl is proportionate to the temperature at which the germicidal action takes place

It is very probable that the ingestion of 30 grains of Hyd cum Cret per day produces, at any rate, a one in half million solution of mercury in the blood (10 stone = 1,175,200 grains)

The *Spirochæta pallida*, we know, is very susceptible to the influence of mercury, these experiments with Variola seem to suggest that the micro-organism of small-pox (whatever it may be, but very probably also a protozoon) is also susceptible

Mercury, in the form in which it exists from the absorption Hyd cum Cret from the alimentary canal, cannot be said to exert an active germicidal influence over all forms of micro-organisms, but possibly the biological processes of the *Spirochæta pallida* and the Variola organism (?) can engender a bactericidal activity in the comparatively inert circulating mercury, possibly, other pathogenic protozoa can also do this

It seems highly probable that mercury has been used before for the treatment of small-pox, but I can find no reference, and the text-books make no mention of it

I am conscious of the danger of drawing conclusions from the results of only eight cases, which might all have taken the simple course they did, without any medication, but still, the results appear worth recording, in the hope that others may be tempted to try this remedy, which at any rate is harmless

CONCLUSIONS

1 Ten grains of Hyd cum Cret three times a day by mouth continued for six days produces no symptoms of poisoning in small-pox (with natives)

2 The drug appears to have a marked action in modifying and reducing the severity of the disease

RUPTURE OF SPLEEN

By AMBICA CHARAN DUTT, M.B.,

Asst Surgeon, Berhampur, Bengal

THE patient was a boy of 12, admitted into the Berhampur Charitable Dispensary on the evening of 31st December 1907, with a perforating wound in his left hypochondrium, just below the costal arch, causing a protrusion of the omentum for about 2½ inches, the wound was caused, two days before admission, by a bullock's horn running right into the abdomen in the spot indicated above The extended omentum was extremely foul and gangrenous The wound was enlarged and the herniated portion cut off, the stump being kept "in situ" by means of a silk ligature

The patient had a quiet night, had two loose motions after magnesia, but tympanitis remained, its intensity changing from time to time, there was no vomiting, no hicough, no restlessness, and no special quickness of pulse indicating peritonitis or internal hæmorrhage, slight tenderness existed, however, from beginning to end

On the morning of the 5th, the temperature was rather high and tenderness and tympanitis increased, accordingly, an operation was decided upon by the Civil Surgeon with a view to draining the peritoneum On opening the abdomen on the left flank, much blood came out and a diagnosis of rupture of spleen was made Nothing more radical could, however, be done as it was evident bleeding had ceased long before, therefore the wound was closed, a drainage tube being left in The patient died at 9 P.M. on the same day

On *post-mortem* examination it was found that the spleen which was more than double the size of the normal was torn on its anterior aspect, the tear extending for about an inch right into its substance from the middle of the anterior surface towards the hilum, the abdomen was nearly full of blood which evidently had been poured out shortly after the original injury, there was no sign of peritonitis, and the original wound was very firmly closed by a bit of omentum which remained there as a plug

The very important question often arises in cases of rupture of spleen, whether the injured person could have been able to make statements at a considerable time after receiving such a severe injury, this case shows that it would be unsafe to make any definite pronouncement on this point

The most complete record of cases of patients who have been considered to have survived for several days is in Lt-Col D G Crawford's exhaustive article in the *Indian Medical Gazette*

Indian Medical Gazette.

OCTOBER, 1908

THE I M S PENSION AT 27½ YEARS' SERVICE

THE announcement made of a new rate of pension of £600 per annum after 27½ years' pension service will be received by the officers of the Indian Medical Service with considerable satisfaction.

It comes into force with effect from 2nd August 1908, and is therefore applicable at once.

We have very frequently expressed our opinion as to the great need of a pension midway between that (of £500) granted after 25 years' pension service and the full ordinary pension of £700 after 30 years' pension service, and we know that many of our senior readers have been very keen to see such an intermediate pension introduced.

The following are therefore the pensions for which Indian Medical Service officers are now eligible —

(i) Invalid pensions for officers "incapacitated for further service in India, on account of unfitness caused by duty," may after two years on temporary half-pay be granted as follows —

After 12 years' pension service	£192 per annum	
Do 13 do do	£212 do	
Do 14 do do	£232 do	
Do 15 do do	£252 do	
Do 16 do do	£272 do	

(ii) Retiring pensions —

After 17 years' service for pension	£300 per annum	
Do 20 do do	£400 do	
Do 25 do do	£500 do	
Do 27½ do do	£600 do	
Do 30 do do	£700 do	
After 30 years' service and		
3 years as Surgeon General,	£1,000 do	
Do do		
5 years as a Colonel	£950 do	
Do do		
3 years do	£825 do	

(iii) Half-pay rates —

Under 5 years' service	£109 10 0 per annum	
After 5 do do	£146 0 0 do	
Do 10 do do	£182 0 0 do	
Do 15 do do	£248 7 8 do	
Lt Colonel under 3 years' service as such	£365 0 0 do	
Lt Colonel over 3 years as such	£501 17 6 do	

Half-pay may be permanent or temporary, but no officer can retire in India on half-pay. It will be seen, therefore, that the rules for pension are on the whole liberal and fair.

As regards the rates of pension there is no doubt that the £700 pension, the highest rate available to a majority of officers, is by no means of the same value as it used to be even 25 years ago. The cost of living at home as in all countries has gone up and the officer who has not saved something to add to his pension will find it difficult to live comfortably even on £700 a year. As for the new rate of pension of £600 after 27½ years' pension service, it will be a boon to many. Owing to the late age of entry into the service of many men who frequently held hospital appointments at home or entered late for other reasons, it was impossible for many to ever reach the full pension. To remedy this the system of granting extensions to complete 30 years was introduced, to men who had got upon what is known as the "selected list" of Lt-Colonels. This, though satisfactory to many, individually was apt at times to press hardly on others by the consequent block in promotion.

This we take it will be considerably lessened by the new pension rate at 27½ years. Men who are badly placed for promotion to the full Colonel's rank will frequently be tempted to take the £600 pension (the more so if they have been careful enough to save some money), or by the time they have reached the limit of 55 years of age.

We understand that the new rule will not interfere with the claims of the fast diminishing band (before 1892), who are eligible for the extra or compensation pension of £100, and consequently a man who has got 27½ years' service plus a compensation pension of £100 will often be glad to retire.

The words "service for pension" have been frequently used in the above remarks. Unfortunately, however, as far as we know, the words mean very different things. To the men of a few years' service, "service for pension" reckons from date of first Commission and includes all leave taken under the leave rules, but to others, again, it means only service from date of first Commission on joining Netley minus the holiday taken between leaving Netley and arrival in India—for others, again, it means service from date of leaving Netley.

It would be a gracious act and one which must be appreciated by the service if one rule was made applicable to all, and if service for pension dated as it does with the younger men from the date of first Commission

At any rate, the new rate of pension is a good one and the service generally will feel grateful to the Director-General for having got it introduced

THE SERUM TREATMENT OF CEREBRO SPINAL FEVER

CEREBRO-SPINAL fever or cerebro-spinal meningitis is one of the most formidable of the continued fevers of India, and hitherto the death-rate in all outbreaks in India, just as in Europe and America, has been about 68 or 70 per cent of cases

It was natural, therefore, that in the recent widespread epidemics in the United States an attempt would be made to try a serum treatment

Several papers have recently appeared in the *Journal of the American Medical Association* (July 4th and July 25th, 1908) which we here propose to call attention to

We may premise that in the United States cerebro-spinal meningitis is largely a disease of childhood and youth, whereas in India it has chiefly been recognised in adult communities such as prisoners, police, emigration camps, etc

In the *Journal of the American Medical Association* (July 4th) Dr F. S. Churchill, of Rush Medical College, reports eleven cases in which he used Flexner's serum

The technique is as follows —

A lumbar puncture is done, 30 c.c. of fluid is withdrawn. The needle is kept in place and an antitoxin syringe attached and the serum allowed to run into the spinal canal. The serum should be heated to body temperature before use. Flexner recommends a dose of 30 c.c. to be repeated every 24 or 48 hours for three or four times if there is no improvement

In another paper in the same issue Dr C. H. Dunn, of the Harvard Medical School, reports on a series of 40 consecutive cases treated with Flexner's anti-meningitis serum, *i.e.*, all cases in which the *Diplococcus intra-cellularis* was found in the cerebro-spinal fluid

The above technique was used if the fluid obtained by lumbar puncture proved cloudy, the anti-serum was injected at once, if the fluid was

clear, no serum was used till subsequent examination revealed the presence of *D. intra-cellularis*

Of the 40 cases in which Dr Dunn has used Flexner's serum in the Boston Hospital, 31 have recovered, a death-rate of only 22.5 per cent as opposed to the universal death-rate of 68 or 70 per cent. Of the nine fatal cases, five were seen in the well-known chronic unconscious state, without fever or active symptoms

The serum so modifies and changes the course of the disease that cases so treated present a very sharp contrast with ordinary cases. The effects of the serum are threefold: first, the production of a fall in temperature, a rapid improvement in the general condition of the patient and the cutting short of the disease

The effect on the general condition and symptoms is most striking and remarkable. The lack of sequelæ is another favourable result, the earlier the serum is given, the better the prospects of aborting a cutting short the disease, the anti-serum has no effect in the late chronic stage

In the *Journal of the American Medical Association* (25th July 1908) Dr Simon Flexner himself gives an analysis of the use of his serum in 400 cases in which it has been used in the United States, Edinburgh, Belfast, etc. The analysis here given is based on cases in which the diagnosis has been established by bacteriological as well as clinical tests

Of the 393 cases tabulated by Flexner in this paper no less than 295 recovered, or 75 per cent of recoveries, a remarkable reversal of the results of treatment by ordinary methods

The following table may be quoted —

Age of patients	No of cases	Per cent of deaths
Under 1 year	22	50
1 to 2 years	19	42
2 to 5 "	68	23
5 to 10 "	79	11
10 to 20 "	105	23
Over 20 "	87	26
Age not given	13	46

The importance of the early use of the serum is shown in the following table —

Period of infection	No of cases	Percentage of deaths
1st to 3rd day	121	14.9
4th to 7th "	100	22
Later than 7th day	107	36

When we contrast these remarkable results with our experience of the terrible fatality of

the disease in India and in all previous epidemics in Europe and America, we may well congratulate the profession in having in Flexner's anti-meningitis serum a remedy of high value, and we strongly recommend all medical men who have to deal with cases to obtain and use this serum

Current Topics.

BOMBAY MEDICAL CONGRESS, 1909

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CRIMINAL LUNACY IN THE PUNJAB ASYLUM

IN the *Journal of Mental Science* for April, 1908, Major C J Robertson-Milne, I M S, has a very interesting study of criminal lunacy as it came under his observation while acting as Superintendent of the Central Asylum at Lahore

The following table contrasts the proportion of criminal lunatics in the various Provinces of India, with those in England, Cape Colony and Jamaica

Showing the Relative Numbers of Civil and Criminal Insane Confined in the Asylums of British India (1904)

PROVINCE	CIVIL INSANE		CRIMINAL INSANE		Total insane	Total criminal insane
	Male	Female	Male	Female		
Bengal	393	138	495	75	1,101	570
Assam	82	25	53	5	165	58
Burma	194	39	108	17	448	215
Madras	320	181	121	14	586	135
Bombay	552	166	101	17	836	118
Central Provinces	143	67	73	7	290	80
United Provinces	641	257	249	36	1,183	285
Punjab	354	105	107	10	570	117
India	2,670	928	1,397	181	5,155	1,578
Cape Colony (1904)	1,023	764	62	11	1,860	73
Jamaica (1904)	—	—	—	—	1,340	82
England (1905)	64,475	64,442	694	215	119,820	912

The enormous proportionate excess of criminal over ordinary insane in India must not be construed to mean a large criminal population. It is evidence of the fact that the people of India have not yet come to regard asylums as hospitals for mental diseases, but rather as a modified sort of prisons where lunatics are detained. This impression will no doubt die out in time, but it exists.

The criminal lunatics in India are infinitely less than in England when regarded from the point of view of the population, less than 1,600 criminal lunatics in all the "teeming millions" of India, whereas in the forty odd millions of England there were no less than 912.

Again, compare the statistics of India and England with regard to the total insane, just over 5,000 in all India, over 119,000 in England. This by no means implies that there is truth in the statement of the first clown in *Hamlet* that the people of England are all so mad that the madness of the young Prince of Denmark would not be noticed among them. It shows that the vast majority of lunatics in India do

not go to asylums, many are harmless, more are tolerated, and asylums are few and far between. Only 1,100 lunatics in 1904 in the 70 millions of Bengal, while there were over 1,240 in the small island of Jamaica.

The following table with Major Robertson Milne's remarks is also worth quoting —

Propensity in criminal activity	PERCENTAGE OF CASES Punjab Broadmoor		Dominant mental origin
1 Violence to person or property	88	86	Malice Lust
2 To sexual acts	0	5	
3 Thieving, fraud, etc	12	9	Acquisitiveness

The absence of criminals in the second class in this country will be remarked. The different standards of morality prevailing in the two countries explains this to a certain extent.

The practice of unnatural sexual acts is, for example, not considered either vicious or criminal by certain classes in the Punjab. Every Pathan and many of the other Punjabis in this asylum, especially those suffering from mania, endeavour at every conceivable opportunity to indulge in them. The suppression of this is one of our most difficult problems, and I personally doubt whether, in this, our attendants can be relied upon to help.

CIRRHOSIS OF LIVER

IN our issue for August (p 306), commenting on the paper by Captain Gordon-Tucker on malarial cirrhosis of the liver, we remarked that the subject needed further investigation, and that the cases of cirrhosis in the infection by the Leishman-Donovan body needed to be examined.

Before the above remarks were published, we received a copy of the first part of the second volume of the *Annals of Tropical Medicine and Parasitology*, published by the enterprising Liverpool School of Tropical Medicine. In this number (at p 147) we find an article entitled "A peculiar interlobular cirrhosis of the liver produced by the protozoal parasite of Kala-azar" from the ever-busy pen of Major Leonard Rogers, I M S.

The case from which Roger's account is taken was seen in the Medical College, Calcutta, in 1907. Body emaciated, history of enlarged spleen, frequent fever for 5 or 6 years. History of taking country liquor "but not in excess". In his 35 days in hospital he suffered from ascites, enlargement of spleen and liver, persistent diarrhoea, anæmia and cough. Temperature only rose occasionally, no malarial parasites found. *Post-mortem*—There was found among other things a few ankylostome bites (common in 75 per cent of *post-mortem* examinations in Calcutta), no ulceration in intestines, liver, 29 oz (body weight only 60 lb), spleen 12½ oz, liver surface perfectly smooth and cut firmly. Kidneys healthy. "The protozoal parasites of Kala-azar" were found in large numbers in the bone marrow, spleen and liver. In the liver "they were found in the endothelial cells of the

capillaries between the columns of hepatic cells in specially prepared specimens" Microscopically, there was a "universal distribution of the cirrhotic process throughout the liver lobules a distinct cellular and fibrous increase around the portal interlobular veins, an absence of the typical yellow lobulated appearance so characteristic of hobnailed liver"

Rogers has noted four cases of cirrhotic change in the liver in 48 recent *post-mortems* on specific Kala-azar cases in Calcutta, while in seven more there were slight changes (For the degrees of enlargement of the liver in such cases, see Rogers' *Fever in the Tropics*, p 66) Rogers next touches on the subject of malarial cirrhosis, and it is to be remembered that till a few years ago cases of sporadic 'Kala-azar' were called "Malarial Cachexia" He states that in 5 years at the Medical College, Calcutta, he only once met with a case of "undoubted malarial cirrhosis of the liver," and his view is that a "true malarial cirrhosis is decidedly rare" On the other hand, "typical atrophic cirrhosis" is extremely common in Bengal, and Major D W Sutherland I MS (Principal, Lahore Medical College), has described its commonness in the Punjab In Calcutta out of 4,000 autopsies, cirrhosis was found in 5 per cent of cases, in Europe it is found in but 1 per cent

The cause of the extremely common ordinary atrophic cirrhosis is therefore a subject for inquiry

ENGLISH ASYLUM DYSENTERY

In the *Journal of Hygiene* (Vol VIII, p 309, June 1908) Drs Aveline, Boycott and Macdonald have a short paper for work done in the Lister Institute on what is well known in English asylums as dysentery, of which sporadic cases are often euphemistically called "ulcerative colitis"

These writers conclude—

(1) That B dysenteriae of Flexner has been found in the stools of 17 out of 19 cases of asylum dysentery, no evidence of the Shiga type was obtained

(2) In 18 cases examined one week to 14 weeks after an attack of dysentery, B dysenteriae was found only once (three weeks)

(3) No evidence was obtained of the presence of B dysenteriae in the faeces of ward contacts (26 cases) with either normal or diarrhoeic stools

(4) The fermentative reactions of B dysenteriae of Flexner towards maltose and cane-sugar are variable

It will be seen that in these respects the English asylum dysentery differs from that in India where the Shiga type predominates, and there is considerable evidence of contacts being the "dysentery carriers" (Foister)

THE ANTI-MALARIAL LEAGUE IN GREECE

A REPORT on the work of the Anti-malarial League in Greece in 1907 is published by M

Hadjimichalis and J. P. Caidamatis, the President and General Secretary of the League, in the *Annals of Tropical Medicine, &c* (Vol. II, No 2, dated June 1908)

We note that these writers state that the plague (malaria) "existed even in the remotest periods of antiquity" We have discussed that question in reviewing a book by Dr Jones and need not here revert to the subject More valuable are the statistics collected during the past nine years in 12 of the largest towns in Greece. According to these statistics, "the average number of deaths from malaria" in the 12 towns is 257, or 9.8 per ten thousand inhabitants Volo in Thessaly has the highest rate, 21.8 per myriad, Pyrgos has a rate of 19.4, and Calamata 13 per myriad

These figures of course do not, after all, afford much information as to the exact prevalence of the disease, for rural areas are supposed to suffer more than towns, and deaths do not indicate the prevalence of attacks of the disease

Our authors say that the plains of Thessaly, Boeotia, Elis, Argos, Liconia, etc, are "all severely scourged by malaria" At Marathon, in October 1906, enlargement of the spleen was found in every child examined (100 per cent) The disease begins in May and commences to disappear in November Relapses, however, are frequent in winter

In 1907, there was in Greece a severe epidemic of malaria, the greatest number of deaths took place in July and August, there was a decrease in September and a fresh increase in October and November Athens suffered severely and the cause is said to be the stagnant parts remaining in the river bed of the classic Ilissus It is reported that the portions of the city near the drained part of this river were but slightly attacked, compared with the portion of the city adjoining the undrained parts

In view of the very similar problem which confronts the Sanitary Department in Bengal and the Investigating Committee now at work, it is of interest to learn something of the methods of the Greek League

The League had already published a bulky volume of reports collected on the prevalence of malaria in various parts of the country, and a malarial chart for the Kingdom is being prepared

A congress of medical men has also met and the League has printed and distributed gratis 30,000 copies of a pamphlet on malaria and its means of propagation So far the expenditure on lectures and meetings have only amounted to the modest sum of £70 (say Rs 1,000)

To test the efficacy of measures proposed in practice, Marathon, a specially malarious plain, was selected, it contained only 1,680 inhabitants, so that to Indian ideas the experiment was on a very minute scale

In April a permanent "Ambulance" was established—two medical men and a laboratory

assistant It was found that about 80 or 90 per cent of the inhabitants of these small villages suffer from malaria, and of 1,216 individuals examined in May, 85 per cent admitted to having had "marsh fever" in the previous summer. The neighbouring river leaves in summer numerous pools in which have been found numerous larvæ of *Anopheles Superpictus*, *claviger* and *bifurcatus*. Antimalarial work was commenced in two ways—(1) by connecting the pools in the river bed into one flowing channel, (2) covering the pools with petroleum once a week, and (3) the regular distribution of quinine to all inhabitants. Quinine was distributed on Saturdays and Sundays in doses of 15 grains, and the writers confessed to the occurrence of inconvenience from symptoms of cinchonism.

They distributed some 24 "seers" (kilos) of quinine and some quinine made up with chocolate was specially appreciated. The quinine was usually distributed in wafers, a method certainly superior to the unpleasant "pice-packets" of dry powder but inferior to the distribution in tablets which we hope will soon displace the pice powders. It appears that of 1,680 inhabitants of Marathion, 1,544 underwent the treatment, and of 1,252 persons about which the writers possess information, of these only 47.6 per cent were attacked by the disease. A more detailed account shows that out of 67 persons who took quinine for over 21 weeks, none were attacked, of 220 who took the drug for 11 to 16 weeks, 48 per cent were attacked, while of 820 who took it irregularly, 46.4 or 56 per cent were attacked. It may be noted that malaria was very prevalent during the period under review.

The average amount of quinine consumed by each inhabitant was 15.6 grammes (i.e., say 230 grains). The whole expenditure was £210—say 30,000 rupees, of which, however, the salaries of the staff account for much more than one half.

We cannot honestly say that the results are very encouraging or worthy of a report in the *Annals of Tropical Medicine* to the length of thirteen pages.

TYPHUS FEVER IN INDO CHINA

In the April number of *The Philippine Journal of Science* Messrs A. Yersin and J. J. Vassal give a short account of an outbreak of typhus among a body of Tonquin coolies who had come to work on the construction of a railway in Annam.

Typhus had never before been recognised in the French possessions of Indo-China.

The report deals with only five natural and two experimental cases, all of which appeared within four weeks of the arrival of the coolies. The five cases all recovered. Attempts were made to reproduce the disease in animals, such as rats, guinea-pigs and rabbits, therefore these greatly

claiming men thought the "relative benignity of this cyclic fever" justified experiments on man.

Two volunteer patients were, therefore, inoculated under the skin of the arm with half a gramme of the blood from one of the typhus cases in the second day of the illness. Fourteen days afterwards intense fever suddenly came on, which persisted for eleven days, identical in character with the natural disease, all the symptoms of which were reproduced with the greatest clearness, but there was neither eruption nor spots.

We cannot believe that these experiments were justifiable and it is a strange doctrine to talk of the "benignity" of typhus.

The authors discuss the diagnosis of the disease and the differential diagnosis between it and relapsing (spuilla) fever, dengue and Kala-azar.

The examination of the circulating blood was always negative and the attempts to reproduce the disease in animals failed. The virus of the disease must exist in the circulating blood, but the specific agent, whatever it may be, is invisible in the blood, or "at any rate is exceedingly rare."

From these experiments our authors conclude that the disease is one of "the blood infections transmitted by the bites of insects." This is probably the case, but the present authors give no evidence of such, though we agree with them that the epidemiology of typhus outbreaks does not disprove the hypothesis.

We cannot but think that this paper is disappointing. It merely proves almost that the blood of the typhus case contains the specific virus, and, indeed, it is by no means clearly shown that these two "experimental cases" could not have received the infection in some other way. In the account given we miss any mention of precautions taken as in the celebrated cases recorded in the well-known yellow-fever experiments of Reed, Carroll and Lazaer.

SEWAGE PURIFICATION

CAPT E. J. O'MEARA, I.M.S., F.R.C.S., D.P.H., has a useful article in the *Journal of Royal Institute of Public Health* (July, 1908), on sewage purification, from which we make the following extracts. On the question of the liquefaction of sewage Capt O'Meara writes as follows—

(1) The inlet and outlet must be submerged, in such a way that the surface scum and sludge have the least disturbance.

(2) By far the best results on the whole are obtained with a capacity of twenty-four hours flow.

(3) That a sewage containing an excess of a trade effluent such as the lac dye and effluents of lac factories in Mirzapur, must be treated by chemical precipitation at the outfall, before being allowed to flow into the septic tank, as this effluent is quite incapable of undergoing any true process of bacterial purification, but can, of course, be more or less clarified by the act of filtering through a filter. An alternative system would be the

precipitation of the effluent at the factories, this would, however, entail arrangements for the disposal of the sludge, and is not likely to be popular or efficient with native manufacturers.

(4) During the rains good detritus tanks are required to remove much mineral matter in suspension.

(5) On the whole, open tanks appear to be as effective as closed ones, but when constructed near dwelling or within city limits, as those in connection with latrines, they should always be closed and not open.

*Sewage Analysis of Excreta from Prisoners in the
Muzapuri District Jail*

	PARTS PER 100,000					
	Total solids	Chlorine	Free ammonia	Albuminised ammonia	Oxygen absorbed in 3 mins	Nitrates
June 5, 1906—The morning excreta of 100 prisoners (feces and urine) well mixed with 300 gallons of well water	263.6	19	7.30	4.76	Could not be accurately estimated	Nil
June 7, 1906—The morning excreta of 50 prisoners (feces and urine) well mixed with 300 gallons of well water	233.8	13.0	4.04	2.30	11.5	Nil
June 9, 1906—The morning excreta of 25 prisoners (feces and urine) well mixed with 300 gallons of well water	142.1	9.0	5.12	2.64	9.360	Nil

These prisoners were all on a diet of ten parts of wheat to four of grain, with vegetables.

(6) In India a septic tank appears to be a much better means of liquefaction than an anaerobic bed (upward filtration).

(7) The degree of purification is relatively slight up to about the twelfth day, from then to about the fortieth day the daily improvement is definite and uniform.

(8) As sludge accumulates, more especially in the early days of working, engineers should so construct their tanks as to permit of this accumulation being readily removed.

(9) If no form of septic tank is used, the filters and contact beds will become clogged, but the former will clog much sooner than the latter.

Septic Tank Effluent. The Analysis was made after the Test Sewage (Excreta of Twenty-five Prisoners' Morning Urine and Feces) had been in the Septic Tank for the following Fixed Periods—

	PARTS PER 100,000						
	Total solids	Chlorine	Free ammonia	Albuminised ammonia	Oxygen absorbed in 3 mins	Oxygen absorbed 4 hours	Nitrates
Analysis of test sewage (25 prisoners' morning excreta, urine and feces, with 300 gallons of water)	142.1	9.0	5.12	2.64	9.363	9.530	Nil
June 19 6 hours	107.3	9.0	7.44	1.34	4.345	5.123	
" 21 12 "	122.3	0.1	6.20	1.08	4.162	4.750	"
" 17 18 "	107.5	0.3	7.32	1.72	4.724	4.800	"
" 16 24 "	94.3	7.8	8.48	.96	3.860	3.995	"
" 28 20 "	116.0	9.3	7.24	1.32	4.624	4.025	"
" 19 21 48 "	131.3	9.2	7.40	.96	4.00	4.665	"

"WHAT IS SCHISTOSOMUM MANSONI?"

UNDER this title Dr. A. Looss, writing from Cairo in March 1908, makes a very vigorous

onslaught on Dr. L. Sambon's attempt to describe a new species of blood fluke, which he labelled *Schistosomum Manson* and which Manson has adopted as a separate entity in his new edition (1907, p. 660). Dr. Looss' paper is vigorously written and with an authority which no one will question, he shatters to atoms the claims of Sambon and of his supporter Holcomb and shows "that (1) the evidence to justify the creation of *Sch. Manson* is absolutely insufficient, (2) the anatomico-pathological proof does not stand any serious test, (3) and the geographical proof is based on a peculiarly one-sided interpretation of the literature. In all the evidence there is not the slightest detail which would really point to the existence of a distinct species in the West Indies and certain parts of Africa. If, therefore, Dr. Sambon wishes to maintain that there is an independent *Sch. Manson* in the above countries the entire proof of its existence remains to be given."

THE BOMBAY MEDICAL AND PHYSICAL SOCIETY

THE *Transactions* (Vol. XII, Nos. 1 and 2, February and May 1908) have just been received (August). At the meeting, February 14th, Lt.-Col. Dimmock read a paper on a case of retro-peritoneal lipoma, weighing over 28 lbs. Major A. Street, F.R.C.S., I.M.S., showed a case of melanotic sarcoma, of the glands in the femoral and inguinal region. Capt. F. P. Mackie, I.M.S., showed the following specimens (1) of the "Negri bodies" in a dog who died of street rabies.

Note the large pyramidal nerve cells containing each a spherical nucleus staining pale blue and a nucleus staining deep red (by Mann's method).

The Negri bodies are stained red and occupy the cytoplasm of the nerve cells, sometimes being seen in the axis cylinder processes. The red corpuscles which stain a pink or magenta colour, are seen in dilated capillaries or free in the neuroglia.

The nuclei of the neuroglia also take a red stain, but are highly granular. Note that the Negri bodies are almost homogeneous in structure and vary greatly in size. Individuals in the above section varied from 1—12 or more.

The nuclei of the neuroglia also take a red stain, but are highly granular. Note that the Negri bodies are almost homogeneous in structure and vary greatly in size. Individuals in the above section varied from 1 μ —12 μ or more.

Specimen (2) shows the multiplication of spirilla carteri (of Indian Relapsing Fever) in the stomach of the body louse.

The picture shows a small bead composed of several scores of individuals.

Specimen (3) is taken from a section (kindly lent by Dr. F. M. Gibson) of the liver of a case of congenital syphilis stained by Levaditi silver impregnation process.

It shows large numbers of the *Treponema pallidum*—(Schaudinn) scattered uniformly throughout the tissues. Note that the parasites are not confined to the blood stream but constitute a true tissue infection.

Capt. T. H. Gloster, I.M.S., read an interesting note on the technique employed in the

estimation of the opsonic index in the vaccination department, St Mary's Hospital

THE following extract from a letter from Prof S Kitasata, dated Tokio, 13th July 1908, on Lt-Col Andrew Buchanan's article on "Cats as Plague Preventers," will be read with interest —

"Prof Koch of Germany, who is now staying with us in Japan, has strongly recommended the keeping of cats as a good method for plague prevention for our epidemic, in consequence of his success in keeping cats on board the ships bound for the tropics, to make them clear of the rodents. Consequently we have been just going to carry his suggestion into practice when the things were thus far going on. I have received your paper, and immediately showed it to Prof Koch who expressed his sincere admiration on your idea as one of the most useful reports on the matter. I am thinking of making an experiment with the Indian cats."

IN the *Annals of Tropical Medicine* (Vol II, No 3, July 1908), Dr E H Ross, the Port Said Health Officer, brings forward evidence to show that "the extermination of the domestic mosquito in Port Said means the prevention of dengue fever, which, although not a fatal disease, is one which causes endless misery in warm climates."

The Calcutta Health Officer, we understand, is waging war against our domestic mosquitoes. Will this have any effect on the prevalence of Rogers' "Seven-day fever" of new comers, which some claim to be identical with endemic dengue?

MAY we remind our readers that it would be a great convenience to the Central Committee of the coming Bombay Medical Congress if medical men intending to join would send in their names and subscriptions at once. We may take it that all service men will join as a matter of course—this being so, they should send their subscriptions to enable the Committee to estimate and make preparations accordingly. The profession in India is bound to make the Congress a success, and the sooner men send in their names and subscribe, the better.

Reviews

Cataract Extraction.—By H HERBERT, F.R.O.S., LT-COL, I.M.S. (ret'd) London. Baillière, Tindall & Cox. Pp viii+391, Illustrations 97. Price 12s 6d net. June 1908.

LIEUTENANT-COLONEL HERBERT has been known for many years as the leading ophthalmologist in Western India, and our pages have been frequently enriched by articles on cataract and other subjects from his pen. He has now retired from the Bombay Medical Service and settled down in practice at Nottingham.

The present handsome volume is the outcome of a long experience of cataract operations in Bombay.

It is known that many years ago Lieutenant-Colonel Herbert published a most useful little book entitled *Practical Details of Cataract Extractions* which has been a guide to many civil surgeons.

The present book, however, is entirely new, and is in no sense a new edition of the older little volume.

The present volume is an up-to-date treatise on cataract extraction, complete and fully informed from the practical point of view of the operating surgeon.

We do not propose here to write a critical review of the book. It will be of more use to our readers if we tell them exactly what the book consists of. Chapter I defines cataract and discusses the stages and varieties of the affection. The second chapter, after a few historical remarks, goes on to describe the operation, instruments, initial steps, the section, iridectomy, dressing and after-treatment. This chapter is eminently practical and runs to 136 pages. Next 16 pages are devoted to hæmorrhage and vitreous accidents. Chapter IV describes variations in procedure and then value. This chapter will be of great interest to many of our readers, as it deals with the views expressed by many operators in these pages, and discusses in a full and fair way the battle of the capsule which waged for some two years in our pages. Few of the writers who took share in these keen encounters will not find their point of view mentioned by Lieutenant-Colonel Herbert, and even the "world's greatest cataract operator," as our author calls Henry Smith of Jullundur, will be satisfied that the operation he has identified with himself is fully treated of and described.

The chapters on after-complications is very full and very good and consists of over 80 pages. Complicated cases are dealt with in the last chapter.

The book is fully illustrated, and these illustrations are as clear as any photographs can well be. The civil surgeon is strongly recommended to obtain this book—it is a mine of practical detail and every page will be found of interest and value. The publishers have turned out the book well. We expect it to be a great success.

Insanity in India, its Symptoms and Diagnosis.—By C F W EWENS, M.D., D.P.H., MAJOR, I.M.S., Superintendent, Punjab Asylum, Lahore. Calcutta: Thacker, Spink & Co., 1908 (September).

THIS book will certainly be widely read in India. It is an extremely lucid, full and interesting study of insanity as seen in India, and records the results of a seven-years' study of lunatics in the Punjab.

We have formed a very high opinion on the usefulness of this book, and we think we can

best serve our readers by briefly giving an account of what is contained in the book.

It consists of 347 pages, 47 chapters and appendices. The introduction discusses the modifications of insanity by environment, and some native Indian views on insanity. The chapters on simulated insanity, on the causation and the influences of sex and age are very good. The classification of the insanities has the merit of convenience and clearly indicates the types met with in India. A couple of chapters give an excellent account of idiocy and feeble-mindedness. The chapter on mania is particularly sound and illuminated by many practical touches. Melancholia is adequately treated and as in other chapters typical cases are described. The description given of stupor is very good and its relations with the cataleptic and somnambulistic states discussed, the symptoms of the four chief varieties of stupor are clearly tabulated. The various forms of dementia are well described and there is a good chapter on dementia præcox or adolescent insanity.

The subject of infection, psychosis or insanity connected with fever and exhaustion and insanity due to abuse of opium, cocaine, etc., occupy chapters 17 and 18. The account of cocaine-eating might have been elaborated, but it is possible that cocaine-eating has not yet assumed the dimensions in the Punjab that it has in Bengal and in large cities like Calcutta and Bombay.*

The chapter on alcoholism and insanity is very good, though it does not form such an important factor in the causation of insanity as it does in Europe and America.

Some years ago we published a study by Major Ewens on toxic insanity following the use and abuse of Indian hemp, and as this is one of the most important subjects in any book on insanity in India, we find it fully and adequately treated here.

The relations of epilepsy and insanity take up chapter 20. Other chapters deal with delusional insanity, obsessional and epochal insanities. Puerperal insanity has a chapter to itself, and also has insanity due to disease. Chorea is described and a good chapter is given on tuberculosis and insanity. Delusions, emotions, memory, speech in insanity are all fully treated and a very useful chapter is the one on speech in insanities.

Criminal insanity, the law of insanies in India, degeneration, one-sided genius, the neurotic type, are all subjects to which a chapter is devoted.

* The rapid spread of the habit of cocaine eating among all classes of natives of India, and especially the schoolboy class, is as extraordinary as it is serious. No amount of fines will prevent the sale. Has it ever struck the kind-hearted opponents of what they call the opium "traffic" that as soon as their well-meaning efforts have made India poorer and promoted the local cultivation of opium in China, where ever opium is prohibited the people will fly to the use of cocaine and other allied drugs. The last stage of such people will be worse than the first.

Then comes two very valuable chapters on criminals and on crime in insanies, these are worthy of careful study by every civil surgeon. The section on moral insanity is good. Homicide and suicide in insanity is adequately discussed. Theft, arson, and incendiarism are treated of. There is a level-headed chapter too on sexual crime in the insane. A note on "running amok" and on the race of idiots, known as "Shah Daula's Mice," with an appendix on dementia præcox, concludes the book.

The book is bound to be a success, such a work was long wanted, the price is low and the book is well printed. We strongly recommend it to all medical men in India and to medical schools and students as a text-book, and we congratulate Major Ewens on its appearance.

The treatment of Gonorrhœa in the Male.—

By CHARLES LEEDHAM GREEN, M.B., F.R.C.S. Messrs Baillière, Tindall & Cox, 8, Henrietta Street, Covent Garden. Pp. xii + 160, Illustrations 47. Demy 8vo. Price 5s net.

THE early production of a second edition of this book proves that it has been well appreciated, and there is little to add to the review on the first edition which appeared in this Journal. The new points are shortly a description of Bier's hyperæmic treatment as applied to gonorrhœal arthritis and one of Goldschmidt's new irrigation urethroscope. This instrument is constructed on a new principle, being an adaptation of the ocular arrangement of Nitze's cystoscope to the requirements of the urethroscope, and is a very clever invention, with it the ocular inspection of the posterior urethra is vastly improved and by its more extended use much light should be thrown upon the affections of this region, the examination of which has previously been fraught with many difficulties. Any one desiring a clear and concise account of this important disease can scarcely do better than purchase a copy of this book. The publishers are to be congratulated on the excellence of the illustrations.

The Practical Medicine Series, 1908—Vol II, General Surgery. Vol III The Eye, Ear, Nose, and Throat. Chicago: The Year Book Publishers. Glasgow: G. Gillies & Co. Price 8s and 6s. nett, respectively.

THESE excellent and thoroughly practical volumes give a very clear and concise review of all the more important work which has been done in the domain of general surgery, and in the diseases of the eye, ear, nose and throat, respectively, during the year preceding publication.

In volume II these portions dealing with abdominal and thyroid gland surgery may be noted as being especially good, and in volume III the articles dealing with cataract, mastoid disease and the larynx appear to us to be worthy of special mention.

To those desirous of keeping themselves abreast of the work which is being done in these

subjects the books will be found indispensable, and they can be cordially recommended to the student and practitioner alike as quite the best of their kind with which we are acquainted.

The printing is in bold and clear type and the plates are of a high standard of excellence.

The Pancreas, its Surgery and Pathology —

By A. W. MAYO ROBSON, F.R.C.S., and P. J. CAMMIDGE, M.B. W. B. Saunders and Co., Philadelphia and London.

OF late years disease of the pancreas has attracted much more attention than previously as evinced by the rapid increase of the literature of the subject, and we may at once say that this book presents in a compact form what is known of the functions and diseases of the organ.

The opening chapters describe the comparative, normal and surgical anatomy of the gland, particular attention being paid to the relations of the bile and pancreatic ducts and their method of entrance into the duodenum and also the variations in size, etc., which may be found between the two pancreatic ducts and the bearing of these points on the surgery of the organ.

The histology and physiology occupy the next two chapters, the various theories as to the functions of the Islands of Langerhans are ably discussed and the views of many authorities are quoted. The authors are of opinion that the balance of evidence points strongly to their being independent structures related to the control of carbohydrate metabolism.

The pathology of the organ occupies a large section of the work and is contained in three chapters headed pathology, fat necrosis and chemical pathology, of these most space is devoted to the last. The method used by the authors for the determination of the amount of fat in the feces is clearly described, and the relations of the quantity in normal individuals and in those suffering from pancreatic disease is fully given, and also the results of a large series of analyses.

The question as to which factor the white colour of the stools in serious pancreatic disease is due is fully discussed, the authors being of the opinion that it is caused by the large excess of fat present. The description of the "pancreatic reaction" as might be expected receives a lot of attention, and the results in 500 consecutive examinations by the "A and B pancreatic method," with or without pancreatic disease, are tabulated, and also in 250 cases by the "C" method. The objections which have been formulated against the value of the reaction are as well candidly stated.

Diabetes is next dealt with, the various theories with the experimental evidence in their favour being detailed.

The chapter on symptomatology and diagnosis is clearly written and very well worthy of careful

perusal. It is stated, in opposition to the idea that in many cases it is impossible to diagnose pancreatic disease during life, that although all the signs and symptoms may not be present in any one particular case, yet there is generally such a combination of them present that with care a correct diagnosis may be arrived at.

The remainder of the book deals with injuries, inflammations, cysts, calculi, etc. The section on chronic pancreatitis is very good, illustrative cases are quoted and the description of the operative treatment is clear and concise. Cholecystenterostomy is the operation of choice for interstitial pancreatitis, and only in cases of contraction of the gall-bladder or unusual difficulty from adhesions is cholecystotomy advised, and then drainage should be carried on for a considerable time. Incidentally the routine removal of the gall-bladder for cholelithiasis is objected to since in the case of any future trouble the short circuiting of the gall-bladder to the small intestine would be impossible. Cases are quoted in which anastomosis of the gall-bladder to the colon was attended with disastrous results. Of interest to Indian workers is the statement that in several cases diagnosed as "hill diarrhoea" analysis of the urine and feces has given results pointing to the pancreas being involved in this disease.

In conclusion, the book can be thoroughly recommended as a clear and concise exposition of the subject; the publishers, too, have done their work excellently.

Manual of Ophthalmic Surgery and Medicine.—By W. H. H. JESSOP, F.R.C.S., London. Second Edition, 1908. J. A. Churchill. Price, 9s. 6d. net.

THE first edition of this useful Manual of Ophthalmic Surgery and Medicine by the well-known senior Ophthalmic Surgeon of "Barts" was well received. The present edition, dated June 1908, has been enlarged and revised, indeed almost re-written.

The book is intended for students and busy practitioners and is eminently practical. The first chapter deals with the examination of the eye and its anatomy, the second is on the use of the ophthalmoscope. That on test types, vision testing, colour vision is very good. Then follow chapters on the disease of the conjunctiva, cornea, sclerotic, iris, pupil, ciliary body, choroid, uveal tract, retina and optic nerve. Chapter 14 deals with amblyopia and other anomalies of vision. The 15th chapter deals with the lens. The ordinary operations are dealt with and a full account given of the suture operation for removal of soft matter, though it is admitted that the method is now seldom employed. The examination of the eyes before operation is well described and sound advice given. The illustration of the extraction sections are very useful. The question of an iridectomy is discussed. Mr Jessop himself rarely uses it.

The 3 mm flat operation is fully described and illustrated. We find no allusion to the method so popularised in India by Smith of Jullundar.

The other chapters are equally good, especially those on refraction. There is also a very useful appendix giving an account of the ordinary drugs and preparations used in ophthalmic practice. The section on general rules for operating is practical and will be read with interest, and the method of bandaging one or both eyes detailed. A useful note on use of local anaesthesia is added and an excellent account of lenses and spectacles and rules for measuring for and prescribing glasses. Another section deals with the vision regulations for the various Government Services. A useful set of types for testing vision is enclosed in a pocket in the cover.

We can strongly recommend the book as a sound and reliable text book for students and practitioners.

Green's Encyclopedia and Dictionary of Medicine and Surgery.—Vol VIII Physiology to Rhinologia. Wm Green & Co, Edinburgh and London.

This monumental work has now reached its eighth volume and the letter R, and it may be expected to be completed in two more volumes.

The first article by Dr Noel Paton on the physiology of nutrition runs to nearly 100 pages and is of special value. The subjects of pregnancy, the puerperium and rheumatism are also ably treated at length. There are 58 articles of more than 1,000 words in length. The chief writers in this volume are, Noel Paton, A E Garrod, Low (on plague), Sir Wm Moore (on pneumonia), Fothergill, Fordyce, Ballantyne, Eden and Watson (on pregnancy), Sir Wm Smyly (on puerperal infection), Miss G Anderson (on puberty), E E Maddox (on refraction), Poynton (on acute rheumatism), Labbe of Paris (on rabies), etc, etc.

We have read many of the articles with interest and found them up to date and reliable.

Current Literature

Parasitology—XVI—*Cimex Rotundatus*, Signoret. By CAPTAIN W S PATON, MRS, Membre Correspondant, Société de Pathologie Exotique (Paris), King Institute of Preventive Medicine, Madras.

A reference to the extensive literature on the bed bug would lead one to suppose there was nothing new to be learnt about this insect, but Mr A Arsène Girault,* who is at present compiling a complete bibliography of the bed bug, some five hundred odd papers, states that the majority of the accounts are of little value and are merely re-compilations, it is, however, surprising to find that erroneous statements regarding the habits of

this pest still exist in modern text books on parasitology. These errors are obviously due to the fact that the writers have compiled their information from old and faulty sources and have not themselves verified the statements of the earlier entomologists. I* recently pointed out that in addition to the misleading and loose statements regarding the habits of this insect, very little was known of the species associated with man. Medical men and others who have conducted experiments with the bed bug often speak of it by a general name, *bug* in English, *wanze* in German, and *punaise* in French, the conclusions drawn from such experiments must therefore lead to confusion, and very little value can be attached to them. The reason for this inaccuracy is not far to seek. *Cimex lectularius*, Linnaeus, is the only well known species, *Cimex ciliatus*, Eversmann, *Cimex rotundatus*, Signoret, and *Cimex macrocephalus*, Fieber, are so imperfectly known that the majority of investigators take it for granted that *Cimex lectularius* is the only bed bug, the others being very doubtful species, for this reason the scientific name is often omitted.

Two years ago, when conducting my experiments on the bed bug of Madras, I considered it was *Cimex lectularius*, Linnaeus, as the only available literature on the subject, described this bug as occurring throughout British India and Ceylon, while *Cimex macrocephalus*, Fieber, was only known from Bhamo (Burma). As the description of *lectularius* did not, however, tally with that of the Madras bug, I obtained some living specimens of *lectularius*, Linnaeus, from London, and at once found the local bug was not the same. About that time I sent some specimens to Mr Distant, who kindly informed me they were *macrocephalus*, Fieber. In order, therefore, to find out whether *lectularius* did really occur in India, I obtained, through the civil and medical authorities, a very large collection of bugs from all parts of India, Burma, Assam, and the Malay Archipelago. As a result of the examination of these specimens, it was found that the Indian bed bug was *macrocephalus*, and that *lectularius*, as far as I was able to ascertain, is limited to the North West Frontier Province and the Kurram Valley. In the recent English edition of Braun's work, *macrocephalus* is not mentioned, but *rotundatus*, the bed bug of the Island of Réunion, is described as a variety of *lectularius*. On reading Signoret's† description of *rotundatus*, I was struck with some important differences between it and *lectularius*, in fact, Signoret gave an exact description of *macrocephalus*. Dr Barberu, Director of the Medical and Health Departments of the Island of Mauritius, to whom I applied for bed bugs, kindly sent me a valuable collection from the Island, and through his French colleagues obtained many hundreds from Réunion. I was thus able to settle with certainty that the bed bug of Mauritius and Réunion is identical with *macrocephalus* of Fieber, and, as Signoret described it before Fieber, I have adopted the name *Cimex rotundatus* for the Indian bed bug. Continuing my investigations of the two species *lectularius* and *rotundatus*, I have found that the former is distributed chiefly throughout the temperate zones while the latter is a tropical or subtropical species. I have recently had *rotundatus* sent to me from the West Indies where, as in the case of Mauritius, it was most probably introduced by Indian coolies, it also occurs in the Congo (specimens kindly sent me by Dr C Wellmann) and Sierra Leone.

As is well known, the family Cimicidae, which contains four genera—*Cimex*, *Ceracus*, *Cocadumus* and *Hematosiphon*—belongs to the Heteroptera, a sub order of the Rhynchotha and comes between the two families Phymatida and Ceratocombida. The genus *Cimex* contains four species—*Cimex lectularius*, Linnaeus, *Cimex rotundatus*, Signoret, *Cimex columbianus*, Jenyns, and

* A Arsène Girault, *Psyché*, June August 1905, December 1905, April June 1906. *Journal of the American Medical Association*, July 14, 1903, "A Bibliography of the Bed bug, *Cimex lectularius*, Linnaeus," *Zoologische Annalen*, 1908.

* Paton, *Indian Medical Gazette*, February 1907.

† Distant, *Fauna of British India—Rhynchotha*, vol ii.

‡ Signoret, V, "Notice sur quelq. Hémipt. nouv.," *Annales Soc. Entomol. France*, 1852, x, p 630.

Cimer pipistrelli, Jenyns All the species have the following characters They are flat, reddish brown insects, with a short, broad head containing two large eyes but no ocelli The thorax, or more correctly the prothorax, is semilunar in shape, with its anterior angles extended, the elytra or wing pads are rudimentary, and lie over the metathorax The abdomen consists of seven segments and an eighth or anal appendage, the legs are slender the anterior tibiae more than three times as long as the tarsi, which are three-jointed, the proboscis is flexed in a groove beneath the head and prothorax.

Cimer rotundatus, Signoret (plate xiii, figs 1 and 2), is of a dark mahogany colour and differs from the type species *lectularius*, Linnæus (figs 3 and 4), in the following respects its head is not as long or as broad as that of *lectularius* its prothorax, which is also narrower and shorter, is rounded to the margin, and quite unlike that of the type species, whose prothorax is raised in the centre but flattened abruptly at a line a little beyond the level of the eyes The abdomen of *Cimer rotundatus* is less orbicular and broadest at the second segment, whereas that of *lectularius* is broadest at the third segment

These are the chief points by which the two bugs can be distinguished, and a reference to the drawings accompanying the paper will at once help anyone to identify them Mr Maxwell Lefroy,* in a recent paper, doubts the validity of the two species *lectularius* and *rotundatus*, and states their distribution is imperfectly known I can only refer him to the typical specimens I have sent him and to my paper on the distribution of the two species I have not yet seen *Cimer eliiatus*, Evermann, which is said to occur in Russia (Kasan), Evermann's description suggests *Cimer columbianus* Jenyns

Cimer rotundatus, Signoret, is chiefly associated with man; but I have had a number of specimens taken in Madras from the yellow bat *Scotophilus kuhli*, which also harboured *Cimer pipistrelli*, Jenyns, the latter species, as far as I am aware, has not been recorded from India before The Indian bed bug, I find, will feed on any animal in the absence of man, and I once placed some on the small Pipistrelle, *P. abramus* which always roosted in one particular part of a punkah in my study The bugs, after gorging, left the bat and secreted themselves in the punkah, returning to the bat when it came back early in the morning The host relations of this bug are therefore of some importance *Cimer rotundatus* breeds throughout the year in India and abounds in all native houses and other places frequented by natives, such as Government offices, tram-cars, railway stations and carriages The bugs are carried about in cloths, bedding, books and furniture The habits and life history are at present being investigated, as well as the best method of destroying the bugs, and the results, I hope, will be communicated later

I shall always be glad to get specimens of bed bugs from India and other parts of the world, the distribution of *lectularius* in North India requires to be worked out more carefully as well as that of *rotundatus* in Africa where Kala azar exists Bugs are best sent alive in a little tin box, the lid of which has been perforated, dead bugs must be put into spirit

ANNUAL SANITARY REPORTS FOR 1907

I

MADRAS.

THE vagaries of the monsoon in 1907 affected many districts in Madras and the prices of food grains rose considerably above the average

* Maxwell Lefroy, *A preliminary account of the biting flies of India, 1907*

+ Evermann, E., "Quidam insectorum species novæ" *Bulletin Soc. Impér. Nat., Moscow, 1841, an.*

A new scheme intended for the bettering of the registration of vital statistics by compulsory vaccination and compulsory registration has been tried The recorded birth rate for the Presidency was 30.8 per mille and the death rate only 24.3 of the census population The death rate improved by three per mille as compared with the previous year

The CHOLERA death rate was 2.2 per mille It prevailed extensively SMALL POX caused 22,435 reported deaths It is expected that the rule for compulsory vaccination will effect materially this mortality As usual Plague was not severe only 2,872 deaths As regards fevers, malarial, prevention had received but "scant attention" from local bodies The death rate for dysentery and bowel complaints is only put at 1.7 per mille Major Clemesha, I.M.S., the acting Sanitary Commissioner, submitted this report

II

PUNJAB

A WET spring, a dry autumn, high prices, an average mortality from ordinary diseases, and an appalling mortality to an extent unprecedented from Plague sums up, writes Major Wilkinson I.M.S., the acting Sanitary Commissioner, the history of the Punjab in 1907 The birth rate, 40, was below the average, and this was due to the prevalence of a malarial epidemic in the autumn of 1906 The death rate was terribly high, 62 per mille The following table shows how the great factor is plague, and it also shows the terrible nature of the RAVAGES OF PLAGUE —

Year	Death rate per mille inclusive of plague	Death rate per mille exclusive of plague,	Plague deaths per mille
1897	31.05	30.07	0.75
1898	3.05	30.95	0.96
1899	29.57	29.55	0.11
1900	* 47.7	47.67	2.24
1901	36.1	35.36	7.35
1902	44.1	35.69	8.41
1903	49.0	38.8	10.2
1904	49.06	29.36	19.7
1905	47.55	30.90	16.6
1906	36.94	32.35	4.56
1907	62.1	31.8	30.3

The success which attended the effort of the Sanitary Department at the great sun eclipse FAIR AT THANESAR, where 20,000 pilgrims attended, is very satisfactory The following is worth extracting in full —

A virulent epidemic of a rapidly fatal type broke out in the Punjab Lunatic Asylum, Lahore, towards the close of the year It appeared on the 6th November and ceased on the 3rd December, and during that period 26 cases occurred and all of them proved fatal From the general resemblance and the post mortem appearances observed by Major Ewens, I.M.S., Superintendent of the Asylum, and from the success of the measures finally taken by him for its arrest, the epidemic was, in his opinion, one of *cholera suavis* It appears from a very interesting report furnished by Major Ewens that the disease first appeared among female inmates and shortly afterwards spread to the male inmates With regard to the origin of the epidemic Major Ewens states as follows — "Taking the disease as cholera which it almost certainly was though of an unusual type, it must of course have been introduced into the female asylum, and the only supposition is that it was introduced by a new admission into the *dhobi* tank where such are always washed This is in close vicinity to the barrack in which these women slept and they were in the habit of drinking from a tap which supplied it and probably they instead drank some filthy water with which she had been washed and thus the drain and jail became infected and so spread to the male asylum, its spread in this way to the barracks and the hospital is not difficult to understand"

We quote the following extracts from Major Wilkinson's remarks on the PLAGUE — "The work of the Plague Research Commission has shown that a certain favourable temperature is necessary for plague activity, the progress of plague in the autumns of 1905 and 1907 clearly indicates that another factor is necessary and this is, presumably, a certain condition of humidity There is a strong presumption that these two factors determine the extent of flea prevalence, and consequently plague prevalence, considerable rain fell in February, March, April and May. Many observers have noted that fleas were phenomenally numerous in the spring of 1907 the worst plague season on record

*The figure is 13.9 if calculated on the population as shown in the Census of 1901

Attitude of the people—With increasing experience of the disease, it cannot be said that the people generally make any endeavour to save themselves, in spite of the widespread educational measures that have been taken to instruct them in the common sense methods of dealing with the disease, which require no special technical skill, and it is only by persistent argument and persuasion that a certain number can be persuaded to accept the measures of relief that are freely proffered to them.

Reporting—The reporting of deaths is considered to be fairly accurate, but, with the uneducated agency that has to be employed for this purpose, it is to be expected that numbers of cases of the milder sort are never recorded. Village registers are checked and the reports collected by the medical staff, as far as it can possibly be done. That rate mortality alone is now a days occasionally reported is a significant fact, which shows that the old fear of compulsory measures, which resulted in concealment of the disease has, to a very great extent, disappeared.

Type of disease, case mortality, etc—The various types of disease are not differentiated by the reporting agency, nor can this be expected, figures, therefore, cannot be given to show their comparative incidence. The large majority of cases are bubonic, but the pneumonic variety is fairly common in the cold weather. It is interesting to note that recrudescence, after a period of apparent freedom, occasionally apparently begins as a case of pneumonic plague, with no evident rat mortality accompanying it. With the present system of reporting, the average case mortality cannot be accurately calculated, there is no doubt, however, that it varies in different localities and at different seasons, being lower at the beginning and end of the seasonal epidemic and also that the epidemic of the spring of 1907 was one of great virulence with a high mortality rate.

Staff—Excluding Civil Surgeons, who act as District Plague Medical Officers in their districts, the following special staff was employed on plague duty, the strength given is that on the 31st December 1907.—Indian Medical Service Officers 15, specially engaged medical officers 3, military assistant surgeons 4, native assistant surgeons 25, hospital assistants 37. Every medical officer, both European and Native, has been engaged up to the full extent of the supply. Recognising that such a staff cannot adequately cope with the epidemic, over such an extensive area of infection, an auxiliary staff, selected from among the leaders of the people, is being gradually organized and educated so that every small area, easily visited by one man, shall have its plague adviser and helper at hand, who will act as a local plague officer and persuade and educate and help the people to take effective action in all measures that are capable of being carried out by the people themselves. Hakims are also being employed to preach and advocate plague prevention.

Mr W A Bagley has the following pertinent remarks in his report as Sanitary Engineer:—"With regard to sanitation generally my opinion is that we will not make further substantial progress till we recognise the fact that the Municipalities of the smaller towns of the Province cannot afford to construct water supply and drainage works for themselves, and if such works are to be made at all we must set aside a liberal sum annually from Provincial Revenues for the purpose. The Punjab Government has made a small beginning in this way by placing a sum of Rs 30,000 annually at the disposal of the Sanitary Board to give grants in aid for urgent Sanitary works to Local Bodies which wish to undertake such works for themselves as far as their funds will permit but have not the means to carry them out thoroughly without assistance from Government. This is a step in the right direction, but we must, I think, adopt a much more liberal policy in the matter of sanitation if we are to show any real progress in the near future. In the last five years, we have carried out a large number of useful Sanitary works in this Province suitable to the needs of the people. Most of these have been for large Municipalities which could afford to pay for them by raising loans in the open market. The smaller Municipalities are now coming forward very slowly because they cannot find the money required for such works. This is what is really blocking progress in this Province. The general Branch of the Public Works Department could easily spend another 3 lacs a year on such works to good purpose if this sum could be allotted from Provincial Revenues. The difficulty in this Province is not so much one of establishment as one of funds."

III.

BURMA.

The post of Sanitary Commissioner, Burma, was only created as a separate entity in the end of the year under report 1907, so that while the department was during the period in charge of Colonel W G King, CIE, I MS, the report is

written by the first Sanitary Commissioner of Burma, Major O E Williams, M D, D F H, I MS.

THE POPULATION OF BURMA is yearly increased by immigration. There also exists a great and insurmountable difficulty as regards accurate statistical data by incompleteness of the Provincial census returns. It is not generally known, we think, that the Burmese population of Rangoon city constitutes only one third of the whole. The birth rate for Burma is given at 32.6 and the death rate at 26 only.

The subject of infantile mortality in Burma is an important one, and we quote the following remark of the Sanitary Commissioner:—"The headquarters branch of the Society for the Prevention of INFANTILE MORTALITY held several meetings at Rangoon during the year. This Society received a grant of land near Hmawbi from Government during the year for the purpose of pasturing cattle with a view to the establishment of a milk depot for infants. Up to the close of the year, however, action in the matter had not been taken. The Deputy Sanitary Commissioner, who attended several meetings of the Society during the year, reports that there is little likelihood of extension of its work until the return from Europe of the distinguished Burmese lady to whose efforts, in large part, the Society owes its existence."

On the subject of CHOLERA the Sanitary Commissioner writes:—"Here, in my opinion, is no reason for doubting that the river water is itself the vehicle for the spread of the cholera poison. The excreta at a modest estimate, of 50,000 persons of the labouring classes comprised in the mill and boring populations, falls into the river directly from overhanging latrines or is washed in by the rising tides and by heavy rain. In the coolies lines of the mills where employees are under little or no sanitary discipline, excreta lies scattered over the marshy ground and alongside the footpaths, and renders easy the conveyance by flies of infective material to the food exposed in the dwellings and cook rooms of the coolies. The remedy is to be found in providing an ample supply of fresh water for all purposes, in introducing an efficient system of conservancy in the riparian quarters, and in preventing by legislation and an effective police organisation, the pollution of the shores of the rivers and creeks. The population about will still be a source of danger, but the opportunities for the spread of infection will be reduced."

A regrettable outbreak of disease diagnosed as cholera, occurred at one of the principal hotels and resulted in the deaths of several Europeans. The infection was transported by the means of food to a charitable institution in the suburbs where two of the sisters in charge died. The origin of the infection could not be traced. Reports were received from Monywa and from several other riverine towns and districts, of outbreaks of cholera starting from infection introduced by boatmen or coolie labourers, and spread by pollution of the river water or of surface pools."

As in Bengal so in Burma the necessity of giving QUININE in a less nauseous form than the dry powder is recognised, and it is proposed to introduce tablets of Quinine. A complete account is given of the outbreak of plague and of the measures of prevention taken. Captain Sargol's work on the preparation of a satisfactory pulicidal solution is well known to our readers.

IV.

BENGAL.

The 40th Annual Sanitary Report of the Sanitary Commissioner for Bengal is written by Lieutenant Colonel F G Clarkson, I MS. The POPULATION of Bengal is reckoned at just over fifty and a half millions. The death rate is given at 37.7 per mille and the birth rate 37.7 also, the general unhealthiness of the year appears to have "devitalised a large proportion of the people and checked the normal growth of the population." The experiment of checking VITAL STATISTICS has been continued, and we quote the following interesting para from Lieutenant Colonel Clarkson's report:—"The experiment started in August 1906 at Gals in the district of Burdwan for testing the registration of vital statistics in rural areas continued throughout the year under report. The *modus operandi* was exactly the same as adopted during the previous year. The numbers of births and deaths actually found to have occurred in the area under operation during 1907, were 1,550 and 2,414 respectively against 1,556 and 2,409 entered in the Thana Register under those heads. The difference in the case of births is due to the fact that in the Thana Register six cases of still births were included, while that in the case of deaths is due to the omission on the part of the chowkidars to report 10 cases of actual deaths and to the wrong inclusion in the Thana Register of five cases of still births as deaths. It also appears that out of 2,404 actual deaths entered in the Thana Register there were 819 cases in which

the causes of death entered were found to be wrong, *vide* the subjoined statement

STATEMENT SHOWING THE RESULTS OF VERIFICATION MADE
BY MEDICAL OFFICER AT GALSI

HEADS OF DISEASES	Total number recorded in the Thana Register	Total number of cases in which the cause of death is found to be wrong	CAUSE OF DEATH AS DETERMINED BY THE MEDICAL OFFICER					
			Cholera	Small pox	Fever	Dysentery and Diarrhoea	Respiratory diseases	Other causes
Cholera	144							
Small pox	17							
Fever	1,845	672	2	2		181	427	57
Dysentery and Diarrhoea	85	2			1			1
Respiratory diseases	20	3	2					
Injury	1							
Other causes	297	142	3		12	112	15	
Total	2,409	819	7	2	13	296	442	59

As regards diseases in 1907 Lieutenant-Colonel Clarkson writes —

"It will be seen that the mortality from cholera, fever and dysentery and diarrhoea during 1907 was higher than in the preceding year in every division except Bihar, while that from small pox was higher everywhere except Orissa. Cholera and dysentery and diarrhoea prevailed as usual with great severity in Orissa, which has gained an unenviable notoriety in this respect, while small pox, which had hitherto been worst in that Division, now shows a satisfactory diminution, although, compared with any other Division, it is worst even now. Bihar suffered least from cholera, dysentery and diarrhoea, while the incidence of fever was least in Orissa, Chota Nagpur being least affected by small pox. Excluding fever as far as the other diseases are concerned, Orissa was the most unhealthy of all the divisions and Bihar the healthiest, Bengal being slightly better than Orissa and Chota Nagpur better than Bengal."

CHOLERA was very bad in 1906, but worse in 1907 when it was second only to the black record of 1900. Small pox too was very prevalent especially in Puri district. PLAGUE was somewhat more prevalent than in the year 1906, but was practically confined to parts of Bihar and to Calcutta city.

The table quoted above shows how far we are relying on the statistics of causes of death as recorded by village headmen. We shall be glad to see the report on the curious WAVE OF SEVERE FEVER in the Beerbhoom district, and in connection with the anti malarial campaign which we notice in a former issue (*I M G*, September p 351), we quote the following from the Government Resolution on this report —

"The report of the DRAINAGE COMMITTEE, appointed by Government to investigate the prevalence and causes of malaria and to what extent it is due to obstructed drainage, was received during the year, and the orders of Government passed thereon. Action has already been taken in respect of most of the recommendations made. The Government of India has just sanctioned the deputation of a special I M S officer for the purpose of conducting a systematic and continuous enquiry into the causes of malaria and the extent to which it prevails, while the question of creating a special engineering division for the examination of the drainage conditions of specified areas is still under the consideration of that Government. The Lieutenant Governor has sanctioned a scheme prepared by the Inspector General of Civil Hospitals for the deputation of a large number of selected Civil Hospital Assistants during the fever season to distribute medical aid in specially malarious tracts. A leaflet containing instructions for self treatment with quinine, and stating where the pice packets can be obtained, has recently been widely distributed in English and in the vernaculars. His Honour desires to invite the attention of the Sanitary Commissioner to the account, given in paragraph 63 of the annual Report on the Jails in this Province for 1907, of the excellent results achieved in the jails by administering doses of quinine during the fever season. Sir Andrew Fraser considers that this and other experience point to the expediency of the

Sanitary Department making an earnest effort to popularise as widely as possible the use of quinine as a febrifuge amongst the mass of the people. The question of adopting special measures in this direction will be taken up separately in consultation with the Sanitary Commissioner and the Inspector General of Civil Hospitals.

The report is one of great interest and is an indication of a renewed activity in Sanitary matters which is very satisfactory.

V

EASTERN BENGAL AND ASSAM

THIS is the second report of the Sanitary Commissioner for the new Province of Eastern Bengal and Assam and is of considerable interest.

Lt Col E O Hare, I M S, who submits the report gives the following tables which give the BIRTH AND DEATH RATES in the different Provinces in India —

PROVINCE	BIRTH RATE		
	1901 05	1906	1907
1	2	3	4
Eastern Bengal and Assam	39 63	37 35	37 01
Bengal	39 59	37 32	37 70
Central Provinces	45 83	51 72	52 46
Madras	29 40	30 90	30 80
Burma	32 90*	32 33*	32 82
Bombay	31 75	33 84	33 03
United Provinces	44 25	40 22	41 15
Punjab	41 60	43 70	40 80
North Western Frontier Province	33 20	38 60	32 52

* Lower Burma only

PROVINCE	DEATH RATE		
	1901 05	1906	1907
1	2	3	4
Eastern Bengal and Assam	31 66	31 67	29 30
Bengal	31 15	36 08	37 72
Central Provinces	31 33	43 47	41 70
Madras	21 50	27 40	24 30
Burma	25 92*	27 16*	26 60
Bombay	38 66	35 06	32 82
United Provinces	36 36	39 07	43 46
Punjab	45 20	36 90	62 10
North Western Frontier Province	25 60	33 73	35 12

* Lower Burma only

We have several times commented on the necessity of examining the conditions of life in Eastern Bengal and Assam where plague has not appeared in an epidemic form. It is probably, as Lieutenant Colonel Hare says below, that such an inquiry might well help to solve some of the still unsolved problems of plague. He writes —

"Eight cases of plague were reported during the year, four cases of the pneumonic type occurred in the Maldah district (two of which were imported) two cases occurred at Goalundo, one in Dacca and one in Tippera."

In connection with this disease, Captain Gonrley, I M S, the Deputy Sanitary Commissioner, made an enquiry to ascertain the species of rats which are found in Dacca and Chittagong.

In Dacca 1,054 specimens were collected chiefly from dwelling houses, grocers' shops and granaries, and were classified as follows —

<i>Mus Rattus</i>	<i>Nesokia Bengalensis</i>	Doubtful
58 40 per cent	41 22 per cent	38 per cent

The *Mus Rattus* predominated in dwelling houses and grocers' shops, and the *Nesokia* in granaries.

In Chittagong, 212 specimens were examined 46 per cent were found to be *Mus Rattus* and 54 per cent *Nesokia*.

Bengalensis, but the *Nesokia* appeared to prevail only in the neighbourhood of the Port

Only two doubtful specimens of *Mus Decumanus* were captured at Dacca

Comparing these figures with the numerical ratios of rats at Calcutta recorded by Dr. Hossack (*Mus Rattus* 14 per cent, *Nesokia* 60 per cent, and *Mus Decumanus* 26 per cent), we find—

(1) That contrary to Dr. Hossack's experience, *Mus Rattus* predominates at Dacca, and probably also in Chittagong

(2) That the *Nesokia*, which forms the majority of the rats in Calcutta, is not so prominent, except in the neighbourhood of the Chittagong Port where its predominance is probably accounted for by the large number of granaries

(3) That the *Mus Decumanus*, which is essentially a sewer rat, is very scarce

The results of the enquiry are interesting, but as the number of rats examined was small, they require confirmation. Seeing that the people of this Province have not hitherto suffered from plague in an indigenous form, it seems probable that a considerable addition to our knowledge of its natural history might be gained by a more extended study of the conditions under which they are living, and their relations with rats and rat fleas.

The success of the method of distributing QUININE BY THE RICE PACKET SYSTEM in this province is well known, and we hope that it will follow the example of the other Bengal in making use of tablets of quinine. We quote Lieutenant Colonel Hare's remarks as follows—

"The total number of packages sold was 18,993,—16,832 in the Eastern Bengal districts and 2,161 in the Assam and Soma Valley districts. There are no figures available for comparison with the sales of previous years in the Eastern Bengal districts, and in Assam there has only been a slight increase of 67 packages.

By far the largest proportion of sales has been in *Bakarganj* (35.13) where quinine has had a great reputation for many years past.

Next in order come the *Khana Hills* (15.23), in which district the drug is regularly distributed by the Welsh Presbyterian Mission, and *Sibsagar* (10.11) where the increase in the sales is entirely due to the personal interest shown by the Civil Surgeon. There are several other districts (*Kyrdpur*, *Chittagong*, *Tippera*, *Mymensingh* and *Rajshahi*) in which the number of packages distributed was considerable, though the percentage to the population is not so high.

The above table also shows that in many of the districts such as *Dinajpur*, *Rajshahi*, *Jalpaiguri*, and *Goalpara* (to take the most obvious examples) where the mortality from fevers is very high, there is ample scope for the extension of sales. In *Kamrup* the sales seem to have made no progress and have only reached 1.8 per cent of the population. Instructions have been issued to Civil Surgeons of all districts in which there are registering circles reporting a mortality of over 35 per mille from fevers, to take special steps to advertise and give facilities for the sale of the drug in the affected villages.

The provincial Postmaster General is taking great interest in the scheme, and has given much valuable aid. He is collecting from each district a list of the Postmasters whose permanent advances he considers might be increased and of those who have experienced difficulty in obtaining their supplies. He is also arranging that all Postmasters shall annually send statements to the district Civil Surgeon of their probable requirements for the year, to enable him to indent beforehand on the Calcutta depot and obviate the risk of supplies falling short during the fever season. The Civil Surgeons have also been instructed not to allow their stock in hand to fall below a certain minimum sufficient to cover emergent expenditure.

It will shortly be necessary to revise the scale of remuneration of the Civil Surgeons' clerks, so as to make their compensation more in accordance with the amount of their business, and in some districts it will also be necessary to provide a temporary peon to pick and despatch the parcels.

Attention is being paid to the issue of advertisements. I believe that much advantage might be gained if these were distributed with more purpose and system.

Little good is to be gained by the present practice of issuing a few thousand copies once in the season and distributing them broadcast over the district. The chance of their reaching the villages for whom they are intended is remote. The drug should rather be advertised on more commercial principles. In each district special limited areas, which are known to be particularly malarious, should be selected, and the advertisements should be liberally distributed at short intervals during the fever season by travellers paid for the purpose.

Several Civil Surgeons have recommended the use of sugar-coated tablets. Captain Ritchie, I.M.S., in *Jalpaiguri*, has been distributing such to selected Postmasters for sale. The majority reported most favourably upon them, and stated

that they were prepared to receive further supplies. Enquiries are being made as to the possibility of substituting sugar-coated tablets for the powders at present in use.

The services of many other agents besides the village Postmasters have been utilised—*Pandits*, Shopkeepers, *Panchayats*, *Zemindars*, *Naibs*, *Vaccinators*, *Mandals*, *Dispensary Hospital Assistants* and *Stamp Vendors*. A certain success with each of these has been obtained according to local circumstances, but on the whole the results have hitherto been disappointing. No agent is so universally employed, or so satisfactory as the village Postmaster.

Correspondence

METHYLENE BLUE IN FEVERS

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—For several years past I have been in the habit of administering methylene blue, from time to time, to patients, suffering from fever, considered to be malarial, on whom quinine seemed to have no beneficial effect. I have now used methylene blue in this manner in a considerable number of cases, and I am convinced that it is a useful stand-by for the treatment of those Indian fevers, which are neither enteric nor tubercular in their nature, and which possibly also are not always caused by the malarial parasite. It is well worth while to try it in such cases when quinine proves unavailing. The dose I generally give to an adult is 2 grs. in pill, morning and evening, and I think it is best not to employ it for more than two or three days together. At the end of this period, whether it has been successful in defeating the fever in whole, or only in part or not at all, it is, in my experience, wisest to drop it, and to change to some other line of treatment, perhaps quinine or arsenic. An argument in favour of the necessity, or advisability, of this change after two, or, at the outside, three days, is to be found in the fact—which, by the way, is not mentioned in any text book so far as I know—that methylene blue is cumulative in the blood. It is excreted in the urine, which it turns deep blue, and, when it has been administered for a couple of days, the urine continues to be tinged with it for several, sometimes as many as six, days after it has been stopped. Two objections to the employment of methylene blue are that it may sometimes upset the digestion, or that it may sometimes cause irritation and a burning sensation in the bladder and urethra; if, however, it be given in moderate doses and for a strictly limited time, these difficulties can be overcome.

I remain, Sir,

Yours faithfully,

G. H. FROST, B.A., M.B.,

MAJOR, I.M.S.,

4th Gorkhas

DIABETES IN INDIA

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—In the programme of subjects, which come for discussion before the coming Indian Medical Congress at Bombay I find that one subject, which is of great interest, is omitted and that is "Diabetes in India." Could it not be included, as I am sure you will agree with me that a collection of opinion on it, will be of greatest help to practitioners in India?

A MITRA,

Chf. Medical Officer,

Kashmir

13th September 1908

TREATMENT OF HYDROCELE

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—In recent issues of the *Indian Medical Gazette* a good deal of discussion has been going on about the radical cure of hydrocele, and various opinions expressed as to details such as site of incision, the number of ligatures applied, etc. No special rule can be laid down, but every case dealt with on its own merits. I have seen many operations done for this complaint, excision of sac as well as partial and complete excision, and found all followed by suppuration, this I attribute to the too free use of ligatures. In most cases the difficulty is to get cases to submit to any cutting operation, they generally prefer the old method of "tapping" with injection. I performed a few cases of partial and

complete excision of the sac in Serampore where the Hospital Assistant informed me the operation had never been done before, all these cases I may say ended in suppuration, healing eventually by the tedious process of granulation.

In my present station I have done two cases (one as large as two good sized coconuts put together) both healing by first intention, no ligatures were left inside nor drainage tubing used, all bleeding points were dealt with by torsion and pressure. In the first case the incision was made low down, the sac was separated by fingers and after the fluid was let out, it was cut off by scissors. In the second case, a large portion of the redundant scrotum had to be taken away, and a good deal of dissection done to release the imbedded penis, owing to cicatricial adhesions from long standing ulceration, the man was in miserable health on admission with extensive scrotal ulceration, he made an uninterrupted recovery, complaining of no pain and no fever, not even the day after operation. I attribute the excellent results achieved in these two cases to the non usage of ligatures, the rapid enucleation of the sac by fingers, and as little knife work as possible. This procedure has the advantage of being short and quick, and I intend to follow the practice in all future cases.

Yours faithfully,

JNO C GILLMON,

Sambalpur

WOUND OF THE ABDOMEN

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—I shall feel highly obliged if you publish the following case in your popular Gazette.

1 Busappa Nuggappa of Chikkerur was admitted into this dispensary with the following injuries on his body—One wound on the left side of his trunk between the 10th and 11th ribs about 2 inches long and placed transversely. Through this wound a portion of small intestines about the size of a lemon fruit was protruding. On this the patient's friends had applied cowdung ashes, etc., and tied the wound. On opening, the portion of intestine was found inflamed and dirtied, this was cleaned properly with warm antiseptic lotions, the skin wound was sutured after replacing the intestinal protrusion and dressing applied.

2 Wound on the middle of the left forearm cutting the radial artery, this wound was about 5 inches long semi-circular and $3\frac{1}{2}$ inches broad cutting the whole thickness of the muscles on the front aspect of the forearm. After tying the artery, this wound was sutured and dressed, few other wounds of less importance.

In publishing this case, I wish to say that these big wounds healed without suppuration and though the intestine was inflamed and dirtied yet there was not the slightest symptom of peritonitis, &c., these wounds were caused by a sythe, a clean instrument.

Yours sincerely,

GANESH RAMCHANDRA

1st GRADE HOSPITAL ASSISTANT,

In charge Dispensary, Hukerur

THE LOCKING GRIP OF LITHOTRITES

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—The range of grip of lithotrites is as Colonel Keegan remarks in his letter published in the July number of the *Indian Medical Gazette*, of vital importance to all who may have to use these instruments, and both that letter and Colonel Keegan's article on lithotrites in the April number must have been read with great interest by many Indian Surgeons. For some time past I have been making enquiries with reference to this question, and there are certain details which I think will very well bear further discussion. In the first place, the point of view of the instrument maker must to a certain extent differ from that of the operator, for, while the latter requires to be provided with reliable instruments of the greatest range of grip reasonably possible, the maker is satisfied if he can produce something he can sell, and which will at the same time meet the case sufficiently well to escape any serious adverse comment. Thus, it is obviously to the advantage of any maker who enjoys a pre-eminent reputation for a special instrument of this description, and can rely on that reputation to disarm criticism, to minimise the strain to which his instruments are exposed, and thereby render them easier of manufacture and less likely to break down when in use. Now, probably in this way, there appears to have arisen a tendency of late years to progressively diminish the crushing range of lithotrites, and while deferring with the greatest respect to Colonel Keegan's remarks, particularly on this subject, and admitting the danger of an

excessive range, my contention is that the locking grip is now restricted by certain makers to an unnecessary extent, to such an extent, in fact, as to make the average lithotrite incapable of dealing with a large proportion of the stones one meets with, at all events in the Deccan and Kithlaw.

In this I am supported by the opinion of several Surgeons of considerable experience, and, speaking for myself, I have fairly frequently had the unnecessary trouble of resorting to perineal lithotomy or the modification of having to substitute one of the forms of lithotomy pure and simple for a crushing operation, as a result of the inadequate compass of the instruments at my disposal. My experience of the older lithotrites of Messrs Weiss, for instance, is that they have an appreciably larger grip than those made by the firm in recent years, and this corresponds with the discrepancy between the measurements quoted by Colonel Keegan in the article referred to above, and those published in his later letter at the request of Messrs Weiss.

That the later scale is unnecessarily restricted is the chief point I wish to lay stress on, and several arguments can be adduced in favour of this view. In the first place, it will probably be generally admitted that the majority of the lithotrites which fail during use jam, rather than break, and that jamming is more often due to an accumulation of fine debris in the groove of the female blade than to the size or hardness of the stone. It has once been my misfortune to have to perform a *suprapubic cystotomy* to free an instrument which bent slightly under these conditions, and became hopelessly jammed. Another reason, of a more personal nature, is that I have used with the greatest satisfaction lithotrites of a considerably larger range by makers not nearly so well known in this connection, and that while in possession of a complete set of Messrs Weiss' beautifully finished instruments, it was these others, two in number, which bore the brunt of the preliminary crushing in the case of any stones at all beyond the average size.

To come to practical consideration I think that instrument makers may fairly be expected to accept a wider responsibility in this matter, while at the same time Surgeons must use discretion in dealing with the larger, and especially the harder stones. Size is by no means the only question, and a stone which weighs an ounce may be a much greater test of good workmanship than another of double the weight and moistening.

Taking the scale quoted in Colonel Keegan's letter in the July number as a basis, then I would suggest that an increase of $\frac{1}{4}$ " might be made in the grip of the smaller sizes, up to No 6 $\frac{3}{4}$ " from No 7 to 10, and $\frac{1}{2}$ " from No 11 upwards. This, it will be noted, is not much in excess of the sizes mentioned in Colonel Keegan's original article, so far as they are quoted.

A HOOTON,

MAJOR, I M S,

Actg Agency Surgeon, Kalthawar.

NOTE—Messrs Weiss' present scale: No 5 with $3\frac{1}{2}$ " grip, No 6 with $4\frac{1}{2}$ " grip, No 7 with $5\frac{1}{2}$ " grip, No 8 with $6\frac{1}{2}$ " grip, No 9 with $7\frac{1}{2}$ " grip, No 10 with $8\frac{1}{2}$ " grip, No 11 with $9\frac{1}{2}$ " grip, No 12 with $11\frac{1}{2}$ " grip, No 13 with $14\frac{1}{2}$ " grip, No 14 with $17\frac{1}{2}$ " grip, No 15 with $19\frac{1}{2}$ " grip, Nos 16, 17, 18 with $22\frac{1}{2}$ " grip.

THE SURGERY OF ELEPHANTIASIS

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—Would Major C R Stevens, I M S, be so kind as to give your readers full details of the case of elephantiasis treated by excision of the affected skin (*I M G*, June 1908, pp 225) especially as regards the method of skin grafting employed, the source of the grafts, and the manner of dressing the limb? The writer would like also information as to the after history. In his experience large grafted areas on the legs are extremely liable to ulcerate under injury or a severe attack of malarial fever, forming the most intractable form of chronic ulcer. Elephantiasis is by no means uncommon in this region, as a rule, however, the condition is more of a hindrance and an annoyance than an actual disfigurement.

AMOI, CHINA,
30th July 1908

Yours, etc,
J PRESTON MAXWELL,
M B, B S, F R C S

[Will Major Stevens oblige?—ED, *I M G*]

QUININE AND PREGNANCY.

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—With reference to the question of quinine and pregnancy appearing in a recent issue of the *Indian Medical Gazette*, I believe it may not be out of place to state my

experience of over twelve years. In several cases in which I had to administer quinine (by the mouth) for malarial fever in females without being aware of the existence of pregnancy, the unexpected result had been an abortion. In most of my cases the pregnancy did not advance beyond the third or fourth month and the doses of quinine administered by the mouth did not exceed 5 grs a dose three times a day. From subsequent enquiry in these cases it had been observed that there was no history of syphilis, or any other cause which might tend to bring on abortion. In the cases where abortion occurred the women were invariably multiparae and were the mothers of from two to three living children, and had had no abortion whatever at any time prior to the administration of quinine. In one case the symptoms were so alarming that the women did not get well for well nigh three weeks, after this incident I have been quite hesitating to give quinine to any female patients who are pregnant. I believe, from my experience that quinine *per se*, exerts a powerful influence in inducing uterine contractions and has been of great use in some cases of uterine inertia.

I shall be obliged if you kindly open a portion of your correspondence columns to a discussion of this important subject by various medical men from their own experience, and after the discussion is completed to give us the benefit of your own observations in the matter.

Yours sincerely,

B SUBBA ROW,

Child Hospital Assistant,

L. F. Dispensary, Manapattu,
Trichinopoly Dist.

26th July 1908

A PHANTOM TUMOUR

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—I send you the following account. Asa Singh Sadhu of Nandpur (Dist. Hoshnarpur), aged 60, states that ten years back he had very strong fever which continued for 43 years accompanied with daily vomiting, general debility with a phantom tumour in the abdomen, with a hard lump on the left side below the ribs. For this hard lump he admitted himself to prominent hospitals in the Punjab and remained in doors for a number of days in each. They all treated him for enlarged spleen, but to no purpose. Then Unani treatment was tried. They also took enlargement of spleen to be the prominent disease but without avail. Now he came to the Randbir Hospital, Kapurthala, three weeks back.

HISTORY ON ADMISSION

A large hard, flat, ovalish tumour in the left hypochondriac region below and in front of the ribs, tender and very painful, partly moveable, bowels very constipated, vomiting frequent, no appetite, digestion nil, great emaciation, debility and prostration. The hard tumour seemed nothing other than spleen, but percussion did not admit that, the part being painful, much bandaging not allowed, and hence patient chloroformed. Percussion revealed the existence of the spleen higher up under the ribs. The junction of the transverse and descending colon being loaded with large dry faecal lumps quite flattened, prominent tender and painful pushing to the left below the spleen, and the ribs for some distance above it, distension from wind below empty colon, all this quite misleading. Now diagnosis became clear under chloroform.

TREATMENT

Enema of soap and warm water with poppy fomentation.

FOOD

Small quantities of milk. For three hours no relief. Enema with castor oil repeated with gentle rubbing of the part downwards, no relief, vomiting continued throughout. A large mustard plaster followed by five drops Hydrocyanic acid, retained the milk given two hours after, gentle rubbing continued, late in the night castor oil 2oz, glycerine 4z, given by mouth retained. On the following morning again repeated without benefit but mouthfuls of milk fairly warm continued. Hard offensive faecal lumps two in number passed away stony inconstitence. Slight appetite felt, milk increased, better retained, patient left to nature on glycerine and castor oil, gentle rubbing and milk. Lumps, large ones, continued passing for three weeks. Appetite improving, sugar added to milk. Hard tumour gradually decreasing, patient improving generally. A little tincture nucis vomica added to glycerine and castor oil with great advantage for a month followed by Easton's syrup.

Tumour disappeared, no pain, spleen coming down to its original site and splenic flexure being felt, no distension, patient gaining fat and flesh.

RESULT

Perfect recovery.

NOTE.—Careful diagnosis revealed the real disease while careless examination kept him suffering for years.

Yours faithfully,

Chief Medical Officer

Service Notes.

DEPUTY INSPECTOR GENERAL ALFRED CHARLES MACRAE, Bengal Medical Service, retired, died at Eastbourne on 20th July 1908, aged 91. Dr Macrae was born on 21st December 1816 educated at Edinburgh University, took the diploma of L.R.C.S., Edinburgh and the degree of M.D. in 1838, and entered the Bengal Medical Service as Assistant Surgeon on 24th January 1839. He became Surgeon on 18th January 1853, Surgeon Major on 24th January 1859, and retired on 28th January 1865, being subsequently granted an honorary step in rank from 22nd September of that year. He served in the Satal Campaign of 1815-46. In last month's Service Notes we referred to him, six weeks after his death as being one out of only three veterans of the Indian Medical Service still surviving, who served in the first Sikh war.

CAPTAIN G. HUTCHESON, I.M.S., a Civil Surgeon, U.P., was on study leave from 14th October 1907 to 27th May 1908.

LIEUTENANT L. A. H. LACK, I.M.S., is posted to special plague duty, in Rangoon.

CAPTAIN N. W. MACWORTH, I.M.S., has been made Officiating Superintendent of the Central Jail, Nagpur, C.P.

SURGEON GENERAL A. T. SLOGGETT, C.M.C., A.M.S., has been appointed P.M.O., Poona Division *vice* Surgeon General Trevor, C.B., appointed P.M.O., India.

THE following promotions are made subject to His Majesty's approval, with effect from the 23rd July 1908—

Senior Assistant Surgeon and Honorary Lieutenant Francis James Daley to be Senior Assistant Surgeon with the honorary rank of Captain (*seconded*).

Superannuated Senior Assistant Surgeon and Honorary Captain Alfred James Pullen is absorbed in that rank.

First class Assistant Surgeons Richard Sharples, Michael Courtney, John Charles Gillmon (*seconded*), to be Senior Assistant Surgeons with the honorary rank of Lieutenant (*seconded*).

First Class Assistant Surgeon Richard Thomas Murphy to be Senior Assistant Surgeon with the honorary rank of Lieutenant, *vice* Senior Assistant Surgeon and Honorary Captain I. Newton, superannuated.

THE services of the undermentioned officers are placed temporarily at the disposal of the Government of Eastern Bengal and Assam.

Captain J. B. Christian, I.M.S.

Captain V. B. Nesfield, I.R.C.S., I.M.S., and

Lieutenant D. C. V. FitzGerald.

THE services of Lieutenant Colonel C. F. Willis, M.D., I.M.S. (Bombay), are replaced temporarily at the disposal of His Excellency the Commander in Chief in India, with effect from the 12th August 1908.

CAPTAIN R. MCCARRISON, I.M.S., an officiating Agency Surgeon of the 2nd class, is granted privilege leave for three months, combined with special leave for three months, and study leave for seven months, with effect from the 1st August, 1908, under Articles 233 and 316 of the Civil Service Regulations, and the Regulations prescribed under the Notification by the Government of India in the Department of Military Supply, No. 16 Medical Department, dated the 15th March 1907.

Captain E. C. Taylor, I.M.S., is appointed to officiate as an Agency Surgeon of the 2nd class and is posted as Agency Surgeon in Gilgit, with effect from the 1st August 1908.

THE services of the undermentioned officers are placed temporarily at the disposal of the Government of the Punjab for employment on plague duty, with effect from the dates noted against their names

Captain H M H Melhuish, I M S	26th June 1908
Captain W F Brayno M B, I M S	3rd July 1908
Captain M S Irani, I M S	28th June 1908
Lieutenant E J C McDonald, I M S	20th July 1908

The services of Captain W W Jendwine, M B, I M S, are placed temporarily at the disposal of the Government of the Punjab for employment on plague duty, with effect from the 17th July 1908

CAPTAIN T S B WILLIAMS, I M S, an Agency Surgeon of the 2nd class, is granted privilege leave for three months and ten days, with effect from the 10th August 1908

Captain M F White, I M S, Mobile Assistant to the Chief Quarantine Officer in the Persian Gulf, is appointed temporarily to officiate as an Agency Surgeon of the 2nd class, with effect from the 10th August 1908, and is posted as Residency Surgeon in the Persian Gulf during the absence on privilege leave of Captain T S B Williams, I M S, or until further orders

MAJOR HENRY SMITH, I M S, whose paper on "Immature Catarrh" read at the Chicago Meeting of the American Medical Association we publish in this issue, had a great reception there. His expenses were paid by the Secretary of State for India. He demonstrated his operation on several occasions, and had a very cordial reception at the hands of the profession assembled in Chicago

LIEUTENANT W B CULLEN, I M S, Assistant Surgeons C G Cio and O J Chudius, have passed the Lower Standard in Burmese

MAJOR E R ROST, I M S, has had study leave in England from 1st November 1907 to 1st May 1908

EXTRAORDINARY leave without pay has been granted to Lieutenant Colonel N E S Davis, I M S, from 23rd October to 22nd November 1908

COLONEL W G KING, C I E, I M S, Inspector General of Civil Hospitals, Burma has been granted one month's extension of leave, pending retirement

MAJOR W G PRIDMORE, I M S, has been granted an extension of leave from 1st August to 15th November 1908

LIEUTENANT C H REINHOLD, I M S, took over charge of the civil medical duties of Kohat District from Captain G Browne, I M S, on 3rd August 1908

CAPTAIN W S PATTON, M B, I M S, is appointed *sub pro tempore* to the Bacteriological Department

THE services of Captain W O Long, I M S, and of Captain E W Browne, I M S, are placed permanently at the disposal of the Government of Madras from 28th June and 1st July respectively

CAPTAIN W G RICHARDS, M D, I M S, is appointed a Medical Store keeper to Government, *vice* Colonel Canthens, I M S, promoted

THE following substantive appointments are made, with effect from the 30th of June 1908, *vice* Lieutenant Colonel F F MacCutie, C I F, I M S, retired Lieutenant Colonel J L T Jones, I M S, to be Assy Master and Major F T C Hughes, I A, to be Deputy Assy Master. Major Hughes is also appointed to act as Assy Master, Calcutta, from the same date during the absence on leave of Lieutenant Colonel J L T Jones, I M S, or until further orders

His many friends in Calcutta and Bombay will miss Lieutenant Colonel Fied MacCutie who retired early in July on attaining his full pension at 30 years' service. He won his C I E in the early days of plague for good work as Port Health Officer at Bombay

CAPTAIN H WATTS, I M S, District Plague Medical Officer, Ambala, has obtained privilege leave of absence under Articles 250 and 260 of the Civil Service Regulations for 18

days, with effect from the 17th July 1908 or the subsequent date on which he may avail himself of it

ON return from the privilege leave of absence granted to him in Notification No 487, dated the 16th of May 1908, Captain C L Dunn, I M S, District Plague Medical Officer, resumed charge of his duties at Guddaspur on the forenoon of the 27th of June 1908, relieving Senior Assistant Surgeon Kishen Chand

DR H COGILL, M R C S, L R C I, Medical Officer on the staff of His Excellency the Governor, is granted leave of absence for eight months from the date of relief

MAJOR F WALL, I M S, whose work on snakes is so well known, has in the press a monograph on snakes to be published by the Asiatic Society of Bengal

CAPTAIN HUBERT INNES, I M S, a Civil Surgeon, E B & A, now on furlough, has taken the M D (London), with a Gold Medal. We congratulate Captain Innes most heartily

MAJOR C L WILLIAMS, M D, D P H, I M S, retired, has joined the staff of Honorary Lecturers at the Liverpool School of Tropical Medicine

CAPTAIN J F BARNARDO, M B, has been appointed Civil Surgeon of Bhagalpore

MAJOR J MULVANY, I M S, has been granted privilege leave from 20th August and Captain J G Murray, I M S, acts as Superintendent of the Presidency Jail, Calcutta, in addition to his other duties

HIS Excellency the Governor of Bombay is pleased to appoint Captain T O Lucas, M B, R A M C, to officiate as Surgeon to His Excellency during the absence of Dr H Cogill, M R C S, L R C I

THE following appointments are gazetted —

Lieutenant Colonel T Granger, I M S, Civil Surgeon of Hazaribagh, on deputation, is appointed to be Civil Surgeon of Murzibagh, *vice* Lieutenant Colonel O R M Green, I M S, transferred to the Medical College, Calcutta, as Professor of Midwifery and Obstetric Physician and Surgeon, Eden Hospital

MAJOR B H DEARE, I M S, Civil Surgeon of Champaran, at present officiating as Civil Surgeon of Hazaribagh, is confirmed in the latter appointment, *vice* Lieutenant-Colonel T Granger, I M S, transferred

LIEUTENANT-COLONEL J G JORDAN, I M S, Officiating Police Surgeon and Professor of Medical Jurisprudence, Medical College, Calcutta, is appointed to be Civil Surgeon of Champaran, *vice* Major B H Deare, I M S, transferred, but will continue to act in his present appointment until further orders

THE following appointments are gazetted —

Senior Assistant Surgeon Kidai Nath Bhandari, Officiating Civil Surgeon, Jullundur, is appointed to officiate as Assistant Plague Medical Officer, Jullundur, with effect from the afternoon of the 3rd of July 1908, *vice* Captain M S Irani, I M S, proceeded on leave

ON return from the privilege leave of absence granted to him in Notification No 169 S, dated the 25th May 1908, Captain H Ross, I M S, District Plague Medical Officer, resumed charge of his duties at Jullundur on the forenoon of the 5th July 1908, relieving Senior Assistant Surgeon Kidai Nath Bhandari

RAI SAHIB PANDIT ATAR CHAND, Civil Surgeon, Ludhiana, is appointed to officiate as District Plague Medical Officer, Ludhiana, with effect from the afternoon of the 15th June 1908, *vice* Captain C E Southon, I M S, proceeded on leave

ON return from the privilege leave of absence granted to him in Notification No 607 S, dated 8th June 1908, Captain C E Southon, I M S, District Plague Medical Officer, resumed charge of his duties at Ludhiana on the forenoon of the 16th July 1908, relieving RAI SAHIB PANDIT ATAR CHAND, Civil Surgeon, Ludhiana

LIEUTENANT COLONEL J GARVIE, I M S, Civil Surgeon of Meicut, holds visiting charge of Saharunpur, during the absence on leave of Lieutenant Colonel K J Marks, I M S

THE following Captains are promoted to be Majors, I M S, dated 29th July 1908 —

Herbert James Walton, M B, F R C S
Henry Robert Brown
Walton Guyon Richards, M B
Archibald Nicol Fleming, M B
Felix Oswald Newton Mell, M B
Frank Dennis Browne, M B
Maxwell Dick
James Henry Hngo, D S O, M B
Raymond Herbert Price, M B, F R C S E
Reginald Bryson, F R C S E

LIEUTENANT COLONEL HENRY ARMSTRONG, I M S, Madras, is permitted to retire from the service, subject to His Majesty's approval, with effect from the 30th June 1908

THE services of Captain C W F Melville, M B, I M S, are replaced at the disposal of His Excellency the Commander in Chief in India

THE services of Captain N W Mackworth, M B, I M S, are placed temporarily at the disposal of the Chief Commissioner, Central Provinces, for employment in the Jail Department

THE services of the undermentioned officers are placed temporarily at the disposal of the Government of the United Provinces for employment on plague duty, with effect from the dates noted against their names —

Captain H C Buckley, M B, I M S	29th June 1908
Lieutenant C E Palmer, M B, I M S	27th June 1908
Lieutenant V N Whitmore, I M S	8th July 1908
Lieutenant N S Sedhi, I M S	8th July 1908

It is understood that Captain Holdich Leicester, F R C S, M B (Lond), M R C P (Eng), will be one of the next Civil Surgeons of Simla

THE services of Captain W W Jeudwine, I M S, having been placed at the disposal of this Government for plague duty, he was posted to Rawal Pindi where he assumed charge of his duties as Assistant Plague Medical Officer on the forenoon of the 17th July 1908

THE Government of India in the Home Department having placed the services of Lieutenant E J O McDonald, I M S, at the disposal of the Government of the Punjab for plague duty, he has been posted to the Jullundur district where he assumed charge of his duties as Assistant Plague Medical Officer on the forenoon of the 20th July 1908

THE privilege leave of absence for 18 days sanctioned for Captain H Watts, I M S, District Plague Medical Officer, Ambala, in Punjab Government Notification No 1505 S, dated the 23rd July 1908, is hereby cancelled

ON return from the privilege leave of absence granted to him in Notification No 590 dated the 4th of July 1908, Lieutenant R J Owen, I S M D, Civil Surgeon, resumed charge of his duties at Rohtak on the forenoon of the 24th of July 1908, relieving Assistant Surgeon Pandit Chandra Shekhar

CAPTAIN M CORRI, I M S, Civil Surgeon, Sialkot, has obtained privilege leave of absence for one month, under Article 260 of the Civil Service Regulations, with effect from the afternoon of the 31st of July 1908

ASSISTANT SURGEON FIROZ DIN MAHROOF, in charge of the civil hospital, Sialkot, is appointed to officiate as Civil Surgeon of Sialkot, in addition to his own duties, with effect from the afternoon of the 31st of July 1908, *vice* Captain M Corri, I M S, proceeding on leave

HIS Excellency the Governor of Bombay in Council is pleased to appoint Major J B Janieson, M B, I M S, on relief by Lieutenant Colonel W A Corkery, I M S, to act as

Civil Surgeon, Satara, *vice* Lieutenant A G Coullie, M B, I M S, and during the absence on deputiation of Lieutenant Colonel C F Willis, M B, I M S, or pending further orders

HIS Excellency the Governor of Bombay in Council is pleased to appoint Lieutenant A G Coullie, M B, I M S, to act as Civil Surgeon, Satara, in addition to his own duties, during the absence on deputiation of Lieutenant Colonel C F Willis, M B, I M S, or pending further orders

THE Government of India in the Home Department having replaced the services of the undermentioned officers of the Indian Medical Service at the disposal of the Government of the Punjab for plague duty, they have been posted to the districts noted below, with effect from the dates shown against their names —

(1) Captain H M H Melhuish, I M S, Assistant Plague Medical Officer, Amritsar, — forenoon of 26th June 1908,
(2) Captain M S Irani, I M S, District Plague Medical Officer, Jullundur, — forenoon of 28th June 1908, and
(3) Captain W F Brayne, at the office of the Inspector General of Civil Hospitals, Punjab, — forenoon of 3rd July 1908

WITH reference to the notification of the Government of India in the Home Department, No 634, dated the 12th of June 1908, Captain H H Bloome, I M S, on relinquishing charge of the duties of Assistant Plague Medical Officer, Rawal Pindi, assumed charge of the duties of Professor of Anatomy, Medical College, Lahore, on the afternoon of the 15th of July 1908, relieving Captain C W F Melville, I M S

LIEUTENANT COLONEL J W U MACNAMARA, I M S, for so many years a well known Civil Surgeon in Assam, is permitted to retire from 12th July 1908 His brother is Lieutenant Colonel R J Macnamara, I M S, I G of Prisons in Madras

THE services of Major H M Earle, I M S, are placed temporarily at the disposal of the Government of the Punjab

THE services of Captain G Fowler, I M S, are placed permanently at the disposal of the Hon'ble the Chief Commissioner of the Central Provinces

THE services of the undermentioned officers are placed temporarily at the disposal of the Government of Madras —
Captain R B B Foster, M B, I M S
Lieutenant W C Gray, I M S

IN a note on the career of Surgeon Major John Bourne, in the Gazette of September 1908 (p 353), he was stated to have been born in February 1809, and to have died, at the age of one hundred, on 5th March 1899 The former date was a misprint, he was born in February 1799

WE commend the following letter to the notice of the many friends of the late Lieutenant-Colonel F S Peck, I M S —

DEAR SIR,—It has been thought that many of the former colleagues, friends, and admirers of the late Lieutenant-Colonel F S Peck, I M S, would like to perpetuate his memory in some suitable manner, and it has been suggested that a fund should be inaugurated for the purpose of procuring a permanent framed portrait of the late Lieutenant-Colonel F S Peck, to be placed in the Eden Hospital, and should the amount collected come to more than the cost of the same, it is proposed to devote the surplus towards the purchase of modern sterilizing apparatus and an operation table for the operation theatre of the Eden Hospital which would bear suitable inscription plates

It is needless for us to recount the great interest which Lieutenant-Colonel F S Peck always took in the Hospital, nor to dilate on the enormous amount of good work which he performed there

WE are pleased to be able to announce that Colonel C P Lukis, M B, I M S, the Principal of the Medical College, has kindly agreed to act as President of the Fund, and Lieutenant Colonel C R M Green, M B, I M S, the Surgeon to the Eden Hospital, to act as Vice President

Contributions towards the above object will be gratefully received and acknowledged by—

J C HOLDICH LEICESTER,
CALCUTTA, }
15th September 1908 }
CAPT, I M S,
(General Hospital, Calcutta,
SATIS CHANDRA DAS,
ASST SURGEON,
6, Royd Street, Calcutta,
Hon'y Secretaries

COLONEL WAITER GAWFN KING, C.I.F., M.D., Indian Medical Service, Madras, has been permitted by the Secretary of State for India to retire from the service, subject to His Majesty's approval, with effect from the 21st November 1908.

Colonel King went home from Burma early in the hot weather. Colonel King will be long remembered as the best known and ablest of the Sanitary Commissioners of India. It is only one who has worked in Madras who knows the amount of good work done by Colonel King in the reorganisation of the Sanitary Department. His excellent work on smallpox and on vaccine is well known, and the Linolin paste for vaccination against smallpox made under his direction is known everywhere in India. His efforts in keeping plague out of Madras have been wonderfully successful.

All his work and his writings were marked by a strong common sense, and were though practical. Always up to date in knowledge, he was not carried away by the first enthusiasms of experts. He had a strong and abiding belief apart from theory, that in the principles of general sanitation relief would be found against mosquitos, fleas and all the ills they carry to humanity.

COLONEL KING has always been a keen supporter and contributor to the *Indian Medical Gazette* and wisely encouraged medical officers to make use of it.

Only three years ago Colonel King severed his connection with Madras when he went to Burma to relieve Colonel N. Macrae, who came to Bengal. During his time in Rangoon the great scheme for an up to date hospital and medical school has greatly advanced, and the post of Sanitary Commissioner was separated as in the other local Governments from that of I.G. of Civil Hospitals.

Colonel King's name will long be remembered in Madras especially, apart from the fact that the King Institute of Preventive Medicine at Gundy will actually for long, we hope, perpetuate his name. We wish him long life and prosperity in his retirement.

LIEUTENANT COLONEL H. W. PILGRIM, I.M.S., Surgeon Superintendent, Presidency General Hospital, is allowed privilege leave for ten days, under article 260 of the Civil Service Regulations, with effect from the 19th September 1908, or any subsequent date on which he may avail himself of it.

CAPTAIN G. KING, I.M.S., reported his departure from India, on leave, on the 18th July 1907.

CAPTAIN F. A. BARNARDO, I.M.S., on leave, is appointed, with effect from the afternoon of the 28th August 1908, to act as Civil Surgeon of Bhagalpur during the absence, on leave, of Major E. A. R. Newman, I.M.S., or until further orders.

2. The unexpired portion of the privilege leave granted to Captain Barnardo, under Government Notification, No. 1564 Medl., dated the 20th August 1908, is cancelled with effect from the above date.

THE services of the undermentioned officers are replaced at the disposal of the Government of Bengal on transfer from Eastern Bengal and Assam—

Captain S. Anderson, M.B., I.M.S.

Captain H. B. Steen, M.D., I.M.S.

Captain O. St. John Moses, M.D., F.R.C.S.E., I.M.S.

CAPTAIN J. M. WOOLLEY, I.M.S. (Bengal), is appointed to officiate as Senior Medical Officer, Port Blair, with effect from the 3rd October 1908, *vice* Major Fearnside, I.M.S., granted 1 year, 6 months and 20 days' leave.

THE services of Captain A. W. Tuke, F.R.C.S. I.M.S., are placed temporarily at the disposal of the Sanitary Commissioner for the Government of Bombay for employment on plague duty, with effect from the 31st July 1908.

THE services of Captain C. H. S. Lincoln, M.R.C.S., I.R.C.P., I.M.S., are placed temporarily at the disposal of the Government of India.

ASST. SURGEON J. E. BOCARDO, I.M.S., is appointed to act as Civil Surgeon, Dhulra *vice* Captain C. H. S. Lincoln, I.M.S., pending further orders.

LIEUTENANT COLONEL F. C. REEVES, I.M.S., was due out from furlough on 28th October.

LIEUTENANT COLONEL F. C. PEREIRA, I.M.S., is due out from furlough on 20th January 1909.

THERAPEUTIC NOTES AND PREPARATIONS

OUR attention has been drawn to the following preparations by the well known firm of E. Merck of Darmstadt—

FIBROLYSIN,

as this preparation is now exciting the liveliest interest in medical circles by the remarkable cures it has effected. Chemically it is a water soluble compound of Thiosinamin and Sodium salicylate, put up in sealed ampullae, each containing the dose to be injected subcutaneously. It is used to cause the removal of all forms of scar tissue whether external or internal, strictures, contractions, etc. The latest successes attending its use are reported in the treatment of croupous pneumonia with retarded resolution and in hardening of the liver (hobnailed liver), the importance of these results cannot be underrated.

At the same time I beg to call your attention to

VERONAL SODIUM,

a recently introduced compound of Veronal, which is 20 times more soluble in water than the latter. Owing to this ready solubility Veronal Sodium is absorbed more quickly and acts prompter than Veronal. The dose is 5 to 15 grains dissolved in a little water, to be taken 1 hour or 2 before bed time.

A very convenient form is

VERONAL SODIUM TABLETS

Prices of Veronal Sodium and Veronal Sodium Tablets are the same as those of Veronal and Veronal Tablets.

We have frequently referred to the use of clothing specially adapted to withstand the actinic rays of the sun. One cloth called *Solano* is well known for this property, and more recently the well known firm, the CELLULAR CLOTHING CO., LD., of 72, Finsbury Street, London, E.C., whose ARTEX garments are well known have introduced RED ARTEX garment which it is claimed are able to withstand the actinic rays.

Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs Thacker, Spink & Co., Calcutta.

Annual Subscriptions to "*The Indian Medical Gazette*," Rs 12 including postage, in India Rs 14, including postage, abroad.

BOOKS, REPORTS, &c, RECEIVED—

Proceedings Royal Academy of Medicine, Vol. I
Chemical Examinations Report, Bengal
Sanitary Commissioner's Report, Burma.
Bengal
U. Prov.
Punjab
Spina and its Treatment, Carnegie Brown (Bale, Sons & Danielson)
The Venoms of Calcutta (Bale, Sons & Danielson)
Operative Midwifery, Munro
Martindale and Westcotts, Extra Pharmacopoeia, 13th Edition (H. Lewis)
Cooper's Sexual Disabilities of Man (H. K. Lewis)
Edinburgh Stereoscopic Atlas
D. Este Emory's Clinical Bacteriology (H. K. Lewis)
Rawlins Surface Marking and Janemarks, 3rd Ed. (H. K. Lewis)
Report on Sitta Malay Institute of Research

LETTERS, COMMUNICATIONS, &c, RECEIVED FROM—

Lt Col Burke, I.M.S. Poona, Lt Col Crawford, I.M.S., Hugh Major Henry Smith, I.M.S., London, Lt Col W. Jennings, I.M.S., London
Major A. Hooton, I.M.S. Bombay Secy, S. I. Branch of B.M.A.
Secy The Medical Club, Agra Capt Frost, I.M.S., Bakloh Major W. D. Sutherland, I.M.S., Sauger Major J. W. Cornwall, I.M.S., Coonoor
Capt. G. L. Dunn, I.M.S., Gurdaspur, Capt. Gidney, I.M.S., Dhulra, Capt. Hay Burgess, I.M.S., Jhelum

Original Articles.

NOTES ON THE RECENT EPIDEMIC OF PHAGEDÆNIC ULCERS IN ASSAM, WITH REMARKS ON A BACILLUS PRESENT IN THE SORES

BY R LLOYD PATTERSON, LRCPs (EDIN),

*Medical Officer of the Empire of India and Ceylon Tea Co.,
Ld., Borjuli, Tezpur, Assam*

ALTHOUGH the fact is not mentioned in the standard text-books, Tropical Phagedæna is endemic in Assam, the ulcers being well known throughout the Brahmaputra Valley as "Naga Sores." It is questionable if the Nagas deserve to have this doubtful honour thrust upon them as hill tribes are usually exempt, except perhaps on their periodic visits to the Valley, where the hot, moist climate from May to September favours the disease. My first experience of these sores was ten years ago in Cachar where there are no Nagas.

Every year a large number of tea garden coolies are treated in hospital for so-called "ulcers," and of these a small, variable percentage is of the phagedæmic type. Occasionally one encounters minor local epidemics, limited to one garden, or group of gardens, but this year the typical phagedæmic ulcers have swept like a plague up the whole of Assam, on both banks of the Brahmaputra, and temporarily incapacitated many thousands of coolies from work during the busiest months of the tea-making season. In

must be enormous, and it would be interesting if the actual figures could be ascertained by the Tea Association.

These notes are based on a series of over 1,000 cases occurring in the hospitals of this company between May 1st and August 31st, 1908, as shown below—

1908	May	June	July	August	Total
Sonajuli	62	157	112	40	371
Borjuli	4	105	124	90	323
Rangapara	18	61	50	36	165
Thakubari	8	21	72	50	151
Dhulapudong	0	3	2	5	10
Namgion	0	0	3	6	9
Sessa	0	1	4	3	8
Grand Total					1,040

Symptoms—When occurring on apparently sound skin, a slight local itchiness is followed by the appearance of a small papule, which soon forms a vesicle surrounded by an inflamed area. This presently ruptures with the escape of a thin sanious fluid, exposing a small, unhealthy-looking ulcer, with a grey base of false membrane. Sometimes there is no prodromal irritation, a small bleb, varying in size from a split pea to a sixpence, being the first symptom (The large blebs described by Manson was only present in the rare gangrenous cases). This ruptures within 24 hours with escape of characteristic, dirty red, sero-sanguineous contents. Next day the subjacent cutis is thrown off in a small slough, exposing a typical grey ulcer with angry areola. In spite of energetic treatment, the ulcer grows steadily for ten to fourteen days, until in the majority of cases it attains about the size of a rupee and presents a very typical appearance (Fig 1 and Fig 2) —



FIG 1—Ulcer on 10th day. Unhealthy skin edges. Granulation not yet begun.

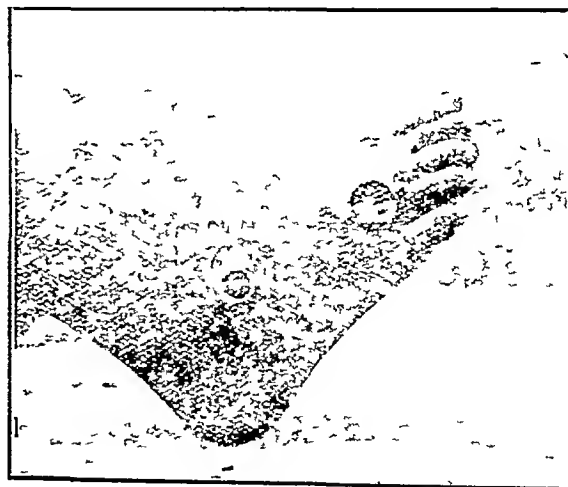


FIG 2—Ulcer on 15th day. Healthy skin edges. Granulation established. Also another ulcer almost healed.

Tezpur district alone there have been at least 200 cases, and the disease was proportionately severe in the neighbouring districts of Bishnath and Mangaldai. On the south bank, Nowgong, Golaghat and Jorhat suffered heavily, and in Dibrugarh District most of the factories have had their labour forces literally decimated. The aggregate loss of labour throughout the valley

It is nearly always perfectly circular and deeply cupped, though not undermined. The fetid exudation is of a dark, rusty red colour and thicker than in the early stages. There is comparatively little pus except in neglected cases. The surrounding skin is somewhat tense and brawny, but pain is seldom severe, though occasionally present.

Constitutional symptoms are conspicuous by their absence, except in the rare gangrenous cases.

In healthy subjects the ulcer now seems to become spontaneously arrested, and after a variable stationary period, during which the remains of the false membrane disappear, granulation occurs, the cavity rapidly fills up and healing may be complete within six to eight weeks from the first appearance of the papule, occasionally the edges of the ulcer become white and indurated, almost horny, the granulations unhealthy and gelatinous, and unless free scraping is resorted to, healing is greatly retarded or the ulcer becomes chronic. In some cases the ulcers do not exceed the size of a shilling and heal within a month or six weeks. In others, they attain the size of the palm of one's hand while still maintaining their characteristic circular appearance. The infiltration and destruction of the subjacent tissues in such large ulcers is very marked, frequently extending to the bone, but slow healing without complications is the rule, even in the largest ulcers.

Only three cases in the whole series assumed the gangrenous type so graphically described by Manson,* extensive sloughing from knee to ankle being followed by partial necrosis of the exposed bones. In these the constitutional symptoms were severe, but did not differ from those of ordinary gangrene, namely, fever, pain, sleeplessness and exhaustion. Two cases died of intercurrent dysentery, the other recovered.

In a large proportion of cases the initial papule is absent, the sore following on some slight skin laceration. As a rule, the typical ulcer is single, but two or three may occur on the same leg or on both legs.

The lesions of cutaneous ankylostomiasis, so-called Water Itch, occasionally become infected, forming multiple ulcers, that are very painful and troublesome. Of numerous syphilitic sores in the various hospitals only one became phagedænic, and of leprosy sores none were attacked. Three cases of yaws also escaped infection. Cuts sometimes become infected, but generally escaped owing to early surgical dressing.

Site—With rare exceptions, the ulcers occur below the knee, the commonest sites being the front of the leg, the dorsum of the foot and the points of the ankle. The bare feet and legs of coolies are naturally most liable to slight skin injuries and subsequent infection, especially if the bacillus lurks in the soil as has been suggested. In one case a typical sore developed on the flexor aspect of the thigh, and here the softer tissues seemed to encourage the phagedænic process, the ulcer rapidly attaining the

size and depth of a small teacup. There were no complications and healing was complete in three months. Two hospital dressers contracted ulcers on their forearms, though their hands escaped.

No sores occurred on the head or trunk.

No Europeans were attacked.

Infectivity—The contagium has been credited by Schenbe with comparatively feeble infective power, but having regard to the recent epidemic, such a view must be modified.

Hitherto great stress has been laid on such predisposing causes as exhaustion, starvation, exposure and debilitating diseases like dysentery, scurvy, and especially malaria. The epidemics previously recorded have occurred among bodies of men depressed by some of these conditions. But during the present epidemic I have not observed any such selective incidence. So utterly diverse were the subjects attacked in a labour force of about 10,000, that no theory of predisposition could be followed out to a logical conclusion. My youngest case was a plump baby of three, an exception to the rule that young children usually escape. Of boys and girls from eight years upwards, the records of every hospital show numerous cases. Among the adults some of the best workers were attacked—healthy, well developed, young men and women, drawing good pay and thoroughly acclimatised. The incidence among new coolies from the famine districts, debilitated and prone to fever, was no higher than among the old coolies, whose standard of health was normal. It appears therefore that the disease may overstep its usual limits of comparatively quiescent endemicity and acquire epidemic properties characterised by an extremely active infection that is quite indiscriminate in its attacks.

Immunity—It was remarkable that nobody suffered more than once from the disease. In some instances an imperfectly healed ulcer would break down and the patient be re-admitted for treatment, but these secondary sores were never phagedæmic, although bacilli were sometimes present.

So far the available data are insufficient to warrant a theory of acquired immunity, with the consequent indication of a suitable serum therapy, but it is noteworthy that a neighbouring factory, which suffered from an outbreak of similar sores last year, involving 50 per cent of the labour force, has remained practically free from this year's epidemic.

On the other hand, several gardens in this company have escaped with a very low percentage of cases, although I cannot trace any reason for their comparative immunity, unless it is that prompt treatment prevented the contagium from becoming generally disseminated.

Hospital Gangrene—This condition is quoted in most text books as having much in common with tropical phagedænia, but the latter is a definite specific disease, limited to the tropics and subtropics, whereas the chief epidemics of

* Manson's description is misleading, because it applies only to the worst cases and makes no reference to the course of the ulcers in healthy individuals. MacLeod's article in Allbutt's *System* is much broader in scope, but his reference to malaria, scurvy, etc., as causative factors does not apply to the Assam epidemic, in which healthy and unhealthy subjects were attacked indiscriminately.

hospital gangrene occurred in Europe, and the condition is now mainly interesting as a relic of the septic past.

That the characteristic lesions of tropical phagedæna—the circular cupped ulcer with grey base and spontaneous limitation—should be related to hospital gangrene seems, from the clinical point of view, highly improbable. Moreover, assuming the identity of Naga Sores with Tropical Phagedæna, the bacillus described below differs from that described by Matzenauer as occurring in hospital gangrene.

Unless further research should prove the identity of the causative organisms, the theory of relationship between the two conditions seems to rest on insufficient data. Incidentally I may add that although hundreds of ulcers were treated in our various hospitals without any special precautions, in no instance was there any outbreak of hospital gangrene.

Treatment—It is unnecessary here to enter into the relative merits of curettage, irrigation, balneation, packing the ulcer and so on. After trying them all, the following routine method was adopted as being least painful to the patient and yielding the most satisfactory results—

After douching the ulcer with hot water to clear off all exudation and debris, the grey base was thoroughly swabbed with pure carbolic acid and the area occluded with a dressing of carbolised vaseline or oil. As a rule, several applications of carbolic acid were necessary before the false membrane was completely destroyed. The only dressings were continued until the granulations were flush with the surrounding skin. At this stage a thin sheet of lead, well oiled, was bandaged over the affected area, flattening all exuberant granulations and preventing the skin edges from becoming raised and indurated. Final healing was undoubtedly quicker and sounder under this lead plate than under any other dressing. The ordinary lead lining of tea-boxes was used, and proved entirely satisfactory. To discard perchloride lotion and other tried antiseptics for the old fashioned carbolic oil savours of heresy, but I am convinced that an oily dressing is best suited for this kind of ulcer. Vaseline with the addition of eucalyptus oil and iodoform was used in some of the hospitals, and gave satisfaction. If the specific bacillus is aerobic, possibly the occlusion of an may be unfavourable to its growth.

Occasionally in some, the larger ulcers healing was greatly delayed by the granulations degenerating into an unhealthy gelatinous surface unfavourable to skin growth, the surrounding skin edge forming a raised, almost cartilaginous ring. In these cases curettage and trimming, under an anæsthetic, followed by application of the lead plate, gave good results.

Quinine, iron, opium and dietetic treatment were reserved for those cases who exhibited any signs of malaria, anæmia, scurvy, etc., but the majority of cases were healthy coolies who went

back to their houses after their sores had been dressed.

I would like to repeat here that the ulcers are not necessarily associated with debilitated or cachectic conditions, as suggested by Manson and others.

Segregation was not attempted as the gravity of the epidemic was not realised at first, but it is no doubt an important measure that ought to be adopted where possible.

Protection of the coolies' feet and legs obviously commends itself, but, as in Water Itch, the coolies themselves object to this form of prophylaxis. While the dressing of the sores is in progress, it is advisable to burn mosquitos ("doona") in a few ashtrays among the patients to keep off the myriads of small midgelike flies ("mango flies") that swarm on to the exposed sores and are probably active agents in the dissemination of the infection.

THE BACILLUS

In the foregoing pages I have assumed that the Naga Sores of Assam are identical with the phagedænic ulcers of Lower Bengal, Indo-China, Straits Settlements, Mozambique, Zanzibar, West Indies, Gambia, etc., now grouped under the general heading of Tropical Phagedæna.

The climatic conditions and the clinical symptoms are the same in all, but it remains to be seen whether the bacillus of Naga Sore is really the hitherto undiscovered organism of Tropical Phagedæna.

The bacteriology of this widespread and important disease has received comparatively little attention from English observers, our present knowledge being chiefly based on the researches of French doctors. All authors are agreed that the disease must be due to a specific microbe, and Le Dantec described a large Gram-negative bacillus as far back as 1884, but it did not stand the test of inoculation and his observations have not been confirmed.

If the following notes do not altogether conform to the canons of Koch, they may at least serve to stimulate further research in the right direction and help to put the vexed subject of these ulcers on a sound bacteriological basis.

When I first took up the microscopy of the subject, it was with ideas of detecting some form of spirochæta or Leishmania, and establishing a relationship between these ulcers and Oriental Sore, but in the invariable absence of such organisms, my attention was attracted to numerous bacilli that were constantly present in the smears.

The first series of slides was prepared for me by Assistant-Surgeon P. K. Mitra of Benjuli Hospital, whose ready help in control and inoculation experiments has been of the greatest service to me throughout.

In specimens taken from untreated cases newly admitted to hospital, the fetid discharge

contained pus cells, blood corpuscles, streptococci, staphylococci, diplococci and other cocci probably putrefactive, that all tended to mask the bacilli. But after a few days' vigorous antiseptic treatment, these pyogenic and putrefactive organisms were practically eliminated and smears could be obtained from freshly washed ulcers that exhibited the highly resistant bacilli to their best advantage.

Leishman's stain gave the finest definition, especially if allowed to act for half an hour or so, but Löffler's Blue, carbol fuchsin, carbol thionin blue and aniline gentian violet were all fairly satisfactory.

That the organism has hitherto escaped observation is possibly partly due to the fact that it has no great affinity for any dye and to ensure good results, prolonged staining or warming the stain is advisable.

Under the microscope the bacilli appear as minute rods, $3\ \mu$ to $3.5\ \mu$ in length and comparatively slender, though not so thin as tubercle or lepra bacilli. For the most part they are straight, but a few slightly curved forms may be seen in every field. The majority are of uniform thickness with rounded ends, but some are slightly fusiform. The staining is often bipolar, showing an unstained central segment resembling a spore, sometimes there are several such segments, giving a beaded appearance. That these are not true spores may be inferred from the fact that they do not stain by the Ziehl-Neelson method or its modifications. On the contrary, the bacilli, beaded or plain, differ strikingly from the "acid-fast" group in being very easily decolourised in weak acid solutions. In an average field the greater part of the bacilli are single, but a considerable number are joined end to end in twos and threes, sometimes more, forming short filaments.

They appear to be non-motile and extra cellular. In the thicker parts of the film the bacilli are massed among the lymph cells and tissue debris, but the massing seems irregular and accidental and exhibits no formation that could be called characteristic such as is seen in specimens of tubercle and lepra. From the above description it will be seen that this organism bears more resemblance morphologically to the bacillus of glanders than to the large bacillus described by Le Dantec, but it differs from both in being Gram-positive. Indeed, Gram's method gives very pretty results, especially if the surrounding cells are counterstained with Bismark Brown, and it should never be omitted in investigating a doubtful sore. The above appearances have been confirmed in numerous slides prepared during the last four months from ulcers in all stages of development, the cases being taken from different factories situated at some distance from each other. The presence of the bacilli in the typical phagedænic lesions was as constant as their total absence in all non-phagedænic sores.

Captain D McCay, I.M.S., kindly made some sections of a piece of ulcer tissue I sent to him and found the bacilli invading the true skin and deeper structures around the base and sides of the ulcer, the invaded parts exhibiting a small, round-celled infiltration.

Want of equipment prevented my carrying out any reliable culture experiments, but I obtained a honey-like liquefaction on potato containing numerous bacilli strongly resembling those present in the sores.

As potato cultures from the ulcers of glanders are characterised by similar colonies, a donkey and a guinea-pig were inoculated, but with negative results. Other inoculation experiments on the lower animals have also failed up to date. *Inoculation from man to man* failed on healthy skin, as long as the procedure of ordinary vaccination was followed, but complete success attended the following method—

A slight preliminary abrasion was allowed to partially heal, and the scab was then removed. A film prepared from the exposed surface showed nothing but a few blood corpuscles and lymph cells. A small swab was then taken from an ulcer containing numerous bacilli and bandaged firmly over the abrasion. At the end of 24 hours there was marked inflammation and 12 hours later the bandage was removed, revealing a small, angry sore surrounded by an inflamed area. The exudation had all the characteristics already described, and on examination showed numerous typical bacilli in practically pure culture. Energetic treatment arrested the phagedænic process at the end of a week, showing the importance of treating these cases as early as possible. This experiment is of practical importance inasmuch as it conclusively demonstrates the infectivity of the disease and points to the urgent necessity of strict segregation in combating an epidemic. Moreover, the coolies should be encouraged to come into hospital in the earliest stages of the disease and the smallest scratches or cuts should be regarded as potential sores and covered with a protective dressing. Unfortunately, coolies seldom submit themselves to treatment until the ulcers are fully established and causing pain or inconvenience. The accompanying photographs give a fair idea of the average type of ulcer.

I hope any intrinsic value of these notes will be shortly enhanced by an authoritative bacteriological report, illustrated by microphotographs, from the Pathological Department of the Medical College, Calcutta, where further investigations on the subject are now being carried out on a coolie from this district suffering from a typical sore.*

* The writer would be grateful for any further information relating to this important disease, especially regarding the phagedænic ulcers found in Indo China, Mozambique, and Guiana.

TWENTY YEARS OF PUERPERAL ECLAMPSIA AT THE GOVERNMENT MATERNITY HOSPITAL, MADRAS *

By G. G. GIFFARD,

MAJOR, I.M.S.

ALTHOUGH the subject of puerperal eclampsia is one which is largely within the domain of those medical men who practise in the large special hospitals of the world, I feel little hesitation in bringing these facts and figures before you, since puerperal eclampsia is essentially a medical and surgical emergency, and, as such, may unexpectedly arise in the practice and daily life of any one of the members of this Branch, and call for skilled and immediate treatment.

It so happens that, although the Government Maternity Hospital has published a very full, detailed and homogeneous report for more than twenty years, the facts and figures in these reports have never, as far as I am able to ascertain, been collected and examined in groups of years, and certainly never over so long a period as twenty years.

When, therefore, on my reporting to the Surgeon-General that the records of the Government Maternity Hospital, although large in number, existed in a rather chaotic and neglected condition, and when I expressed an opinion that there must be valuable clinical and statistical material in all these old books, he very kindly asked Government to sanction the temporary entertainment of a clerk to help me to sort out and arrange the mass of books and papers, and Government were pleased to do so two months ago. The figures which I now have here, excerpts from which I hope now to give you with some comments, are the first fruits of this arrangement. I need hardly, perhaps, remind a meeting of medical practitioners of the leading facts and the characteristic symptoms and signs of puerperal eclampsia, but I will ask your permission to recall to you that—

- (1) It is usually a disease of young women who are pregnant for the first time, and have already progressed in that pregnancy towards the later months.
- (2) That it is a very serious and fatal affection, both for the mother and for the unborn child.
- (3) That the onset is often terrifying in its suddenness, and rapid in its fatal termination.
- (4) That a fierce controversy still rages as to its pathology and the best methods of treatment, especially as to the correctness or otherwise of employing *accouchement force* (to which procedure, I may say, I have a very strong antipathy).

The figures on which my conclusions to day are based, are, I hope, sufficiently large to enable the results to escape the many fallacies of limited statistics. The only similar, or somewhat similar, statistics, notice of which I have been able to find, are those of—

Charpentier 454 cases
Olehausen 200 "

Those I now bring up are 365 cases—no others seem to have been made up for cases occurring in India.

I do not propose to smother you in figures, of which I have a great many ready here, but will explain the scheme on which the work has been done. I first drew up the Table I, and decided, with Captain Hingston's help, what facts were worthy of record, and then taught the clerk how to read through the case sheets and what to note and look for. I had intended to do this all myself, but to those who have not tried to do this kind of work the amount of labour that is involved is incredible (6 hours every day for one smart clerk).

The result of this first bold collection of facts was Table I. (Not given.)

From the facts in Table I, Table II was evolved, and it is here that useful information begins to be unfolded from the previous scattered mass of statistics.

Table II was then compiled from the facts recorded with 1886 and 1907 added.

TABLE II

Date	Number of cases	Mothers died	Percentage of Mothers' deaths	Children died	Percentage of Children's deaths
1886	18	9	50	9	50
1887	15	5	33½	5	33½
1888	17	5	29.52	4	23.52
1889	10	3	30	7	70
1890	No records available				
1891	17	1	5.8	6	35.29
1892	20	7	35	8	40
1893	19	9	47.36	7	36.84
1894	12	2	16.6	6	50
1895	23	8	34.78	10	43.47
1896	25	8	32	7	28
1897	21	4	19.04	9	42.85
1898	7	2	28.57	2	28.57
1899	9	2	22.2	5	55.5
1900	18	5	27.76	9	50
1901	23	9	39.13	12	52.2
1902	26	10	38.46	13	50
1903	32	5	15.62	15	46.87
1904	26	9	34.61	16	61.53
1905	30	5	16.66	19	63.3
1906	15	4	26.6	6	40
1907	17	3	17.6	6	35.3

The results obtained by the compilation of these tables are apparent but it seemed necessary to compile a table, III, shewing statistically the various methods of treatment. The actual years during which any particular form of treatment was adopted, is shown in Table III, which was made out for 22 years and includes 400 cases.

These facts, interesting as they are, are not those that I had set out to discover. Useful and pleasing exercise as it is to see these into the mirror of hospital practice of Harris, Branfoot, and Sturmer, it seemed to me necessary to scrutinize their results.

Of 365 cases in 20 years (1887 to 1907) 11 died (4 & 7) undelivered, and these are therefore excluded.

Death rate of mothers	29.5 per cent
Death rate of children	46.3 "
In the first decade, death-rate of mothers	34.4 "
In the first decade, death rate of children	44.8 "
In the second decade, death rate of mothers	31.1 "
In the second decade, death rate of children	53.0 "

It is interesting to note with reference to the change in methods of treatment since 1900—

Death rate of mothers was	From 1886—1900
Do children was	31.1 per cent
	44.3 "
Death rate of mothers was	From 1900—1907
Do children was	27 per cent
	51.3 "

* Transactions South Indian Branch, B. M. A., Vol. XVI, No. 1 (1908).

TABLE III — From 1886 to 1896

Year	A C E mixture	Ergotino	Chloral Hydras	Potass Bromide	Iodoform	Quinine Sulphate	Digitalis	Castor Oil	Spt Ammon Acetat	Chloroform	Ice to head	Acid Sulph dil	Pulv Jalap	Diaphoretic mixture	Spt Ether	Santonine	Morphia	Ferri perchloride	Hunyadi	Perchloride of Mer cury	Pot Acetat et citrate mixture	Strychnine
1886	1		14	15		3	1		2	18	5			9	2							
1887		3	13	13		3	4	2	3	12	4	2		11	3						1	
1888	2	2	15	14	2	6	4	4	4	12	7	4	2	7	3	1						1
1889	1		9	7	2	2		4		8	4	1	2	4	1	1	2	1				
1890							No report was made this year															
1891	1	5	14	13	2	6	3	6		15	6	3	4	8	1	2	1	3	1			
1892	2	3	12	14	2	4	5	8	2	17	6	3	1	12	3	2	5			1		
1893	1	3	16	15	2	5	5	5	4	19	8	2		7	1	4	1	1	2			
1894			12	8		2			1	12	1			2			1				6	
1895		1	9	9	1	2	1		1	14	3			6	1						5	1
1896	2		24	20		7	8	8	5	28	4		5	10	1	2	1		3	1		1
Total	10	17	138	128	12	40	34	37	22	155	48	15	17	76	16	12	18	6	9	3	12	2

The treatment will be seen to have changed slowly in the 20 years and the number of cases treated in the different ways can be grouped as under —

1886—1896 (158 women treated)

Chloroform	155 cases	Purgatives	55 cases
Chloral Hydras	138 "	Santonine	12 "
Bromide	128 "	Thyroid extracts	0 "
Diaphoretic	76 "	Saline Solution	0 "
Morphia	18 "	Stomach washing	0 "

TABLE III — From 1897 to 1907

Year	Saline	Morphia	Castor Oil	Digitalis	Mag Sulph	Pot acetate et cit rate mixture	Thyroid	Strychnine	Hunyadi	Chloroform	Stomach washing	Pot Bromide	Chloral Hydras	Liquor Ammon Acetate	Ergotine	Perchloride of Mer cury	Santonine	Quinine Mixture	Pulv Jalap	Diaphoretic
1897		1								13		12	14							6
1898						4				7		2	7							12
1899		5	2			5				8		2	4	1		1	1	1	1	1
1900	4	15	3			5		1		9		3	5	1			3	2	2	1
1901	12	19	2	2		11		2		10		2	1	2				1	1	2
1902	16	23	2			7	6	4		14		1	1	1		3		1	6	1
1903	8	30	1	1	2	17	22	2	9	11		1	1	1			3	1	3	1
1904	9	23	2			17	25			10		1	1	1					1	1
1905	12	21	7	13	4	15	17	3	4	14	3	1	2	3		1	3	3	2	1
1906	7	13	2		7	2	10	1	4	7	11	2	2		2					1
1907	8	14					13			14										1
Total	77	164	23	17	13	84	103	13	17	117	14	32	38	9	3	5	10	9	26	24

The treatment will be seen to have changed slowly in the 20 years and the number of cases treated in the different ways can be grouped as under —

1897—1907 (207 women treated)

Chloroform	117 cases	Purgatives	83 cases
Chloral Hydras	38 "	Santonine	10 "
Bromide	32 "	Thyroid extracts	103 (all since 1902)
Diaphoretic	24 "	Saline Solution	77 cases
Morphia	164 "	Stomach washing	14 (all during 1900)

TABLE VII

Total No of cases, 17

MOTHERS DIED		CHILDREN DIED	
4=17 6 per cent		6=35 3 per cent	
AGES			
6		19 years	
2		18 years	
3		20 years	
1	...	15 years	
1		26 years	
2		16 years	
1		23 years	
1	..	14 years	
DELIVERY		MOTHERS DIED	
Natural Delivery 7		1=14 3 per cent	
Aided Delivery 10		2=20 per cent	
TREATMENT			
Chloroform	Morphia	Thyroid	Saline
14	14	13	8
Diaphoretic	Forceps	Barnes' B	
1	8	2	
Bossie's Dilator	Digital dilatation		
1	3		
Albumen present	Albumen absent		
+A 10	-A 7		

GLEANINGS FROM THE CALCUTTA POST-MORTEM RECORDS

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NO 1 ON THE SUPPOSED RARITY OF GALL-STONES IN THE TROPICS *

EVER since 1872 *post-mortem* records have regularly been kept at the Medical College, Calcutta, and the series probably contains a unique storehouse of facts regarding tropical pathology, which have hitherto not been utilised for want of an index to any but the earliest volumes. During the first nine years, during which that accomplished physician and pathologist, Dr J. F. P. McConnell, was in charge of the department, the value of the records are greatly enhanced by the addition of full clinical notes of all the cases, including their progress and treatment, such as are, unhappily, not available at the present day, when so little time is left from lectures for clinical work. During the last few years I have had all the volumes indexed so as to allow of different classes of cases being analysed, and propose from time to time, as leisure allows, to publish the results of inquiries of this nature, of which the following is the first.

"On the other hand, in India, and in the tropics generally, gall-stones are said to be extremely rare, one or two cases only having been recorded." So writes Professor Mayo Robson¹ in Clifford Allbutt's *System of Medicine* (first edition), and this view is in accordance with some of the generally accepted ideas as to

the etiology of the disease, such as the predisposing effect of sedentary habits and tight lacing in European females, but not among the class of cooly women who come into an Indian hospital. On the other hand, a highly fatty, fatty diet, which is nearly universal with most natives of India, is said to predispose to the disease.

With the help of Babu Rajendra Lal Sircar, L.M. & S., to whom I am much indebted for his assistance, I have worked out the incidence of gall-stones in 4,544 consecutive *post-mortems* in which the condition of the gall-bladder was noted, and have embodied the results in the accompanying tables. As the ages of *post-mortem* subjects in Calcutta probably average much lower than those of temperate climates, I have also worked out the race, age and sex of 1,040 *post-mortems* taken from volumes in different decades of the series, so as to furnish a fair sample of the whole for calculating the incidence of gall-stones in different races and ages.

GENERAL INCIDENCE IN INDIA

The first fact brought out by this enquiry is that, so far from gall-stones being very rare in the tropics, they are actually more common than in some European climates. Thus, in 233 out of 4,544 bodies in which the gall-bladder was noted, or in 5.37 per cent against 4.4 per cent in Dr Brockbank's hospital cases in Manchester, and that too in spite of the low average age of the patients, which should make them less prevalent in Calcutta.

RACE INCIDENCE

Owing to certain differences in the diet and customs of various races in India, the relative prevalence of gall-stones among them is a matter of great interest. The results of my investigation of both the race and sex incidence are shown in table I. The first two lines of

TABLE I

Race and Sex incidence of Gall stones in India

	Hindus	Mahomedans	Europeans	Native Christians	TOTAL
Percentages of different races in 1,040 <i>post-mortems</i>	67.1	21.8	7.0	3.8	
Incidence of 232 gall stones in different races	65.1	16.8	14.7	3.5	
Percentage of the sexes of each race in 1,040 <i>post-mortems</i>					
Males	74.0	85.0	78.4		76.5
Females	26.0	15.0	21.6		23.5
Percentage of Gall stones 4,544 <i>post-mortems</i>					
Males	3.5	3.8	8.8		4.05
Females	7.7	4.7	17.1		8.1
TOTAL	4.9	3.9	10.7		5.37

* Read at the Med. Section, Asiatic Society of Bengal

Table I show the proportion of the different races presenting gall-stones, and their relative numbers in the *post-mortem* books. They show that gall-stones occurred in very closely the same proportion as the total subjects in the case of both Hindus and Native Christians, and only a slightly lower proportion in Mahomedans, but they were found in double the proper proportion in European bodies. Line 7 shows the percentage of gall-stones in each race, which illustrate the same facts. These variations will have to be considered further in relation to the sex and age incidence of the subjects, before the question of any possible influence of race alone on the incidence of gall-stones can be dealt with.

SEX INCIDENCE

It is a well-known fact that gall-stones are more frequent in females than in males in Europe, the causes usually assigned being sedentary habits and tight lacing. As these customs are not found among the poor native women who furnish *post-mortem* subjects in Calcutta, the sex incidence in the tropics should afford some evidence as to the potency of these alleged factors. Lines 5 and 6 of table I give the required data, and reveal the striking fact that in each class, there is a markedly greater prevalence among the female sex, in whom they are almost exactly twice as common as in males, except among the Mahomedans, in whom the disparity is much less marked. This exception is certainly not in favour of the sedentary habit theory, for the Mahomedan women are just those who are most shut up in India, although much less so in the poorer than in the richer classes. The figures show the actual incidence of gall-stones calculated in accordance with the proportion of each class found in the analysis of the 1,040 cases in the *post-mortem* books. The proportions of males to females in these records for each class are shown in lines three and four of table I. From these figures it appears that about one-fourth of the total *post-mortems* were in females, and this is about the proportion in each race with the exception of the Mahomedans, in whom only 15 per cent of the subject were females. As we have just seen that gall-stones are twice as common in females as in males, this low proportion of females partly accounts for the lower total percentage of gall-stones in Mahomedans as a class. It does not, however, explain the low rate in Mahomedan women, which is calculated on the number of this class, whose ages remain to be considered.

AGE INCIDENCE

It is well known that the frequency of gall-stones increases steadily with advancing age. Table II shows both the age incidence of each decade for each race, the total for either sex, and the grand total, together with the figures of

Schroeder as quoted by Mayo Robson. The column of the total figures shows very clearly the steady increase with that of the age of the subjects. Below 21 years just under 2 per cent had gall-stones, and between 21 and 30 the rate was only 3.2 per cent. From this time on a marked increase occurs, the percentage steadily rising during the next three decades to reach 10 per cent between 51 and 60. Over 60 there is a sudden leap up to 22 per cent. The figures for each race present a similar steady rise (those of the Native Christian class have not been worked out owing to their number being very small), moreover, the slightly lower rate of the Mahomedans, and the much higher one of the Europeans, already referred to, is seen also to hold good for each age period in a remarkably constant manner, showing that the differences are not in any way accidental.

Once more, the figures for either sex show that the much higher rate for women than men also holds good for each age period. Those of the males show the same steady increase as the total figures, but those of the females presents some irregularity, revealing itself in a disproportionately high rate between 41 and 50, and a correspondingly low figure for between 51 and 60. It is worthy of note that the excess occurs during the period when the change of life occurs, and the period of child bearing terminates, for this fact, taken with the constancy of the high incidence of gall-stones among women of each race, with their very varied diet, customs, and habits, points to some inherent difference between the two sexes, probably metabolic in nature, as the essential cause of the divergence, and not any minor and inconstant customs, such as tight lacing or sedentary habits, which have for so long been credited with this evil influence.

EFFECTS OF VARYING PROPORTIONS OF THE AGE PERIODS OF DIFFERENT RACES ON THE INCIDENCE OF GALL-STONES

The fact that gall-stones are from two to seven times as frequent in persons over 30 years of age as in younger persons, makes it necessary to take into account the proportions of persons above and below this age in different races, before coming to a final conclusion regarding the influence of race itself on the incidence of gall-stones. The necessary figures worked out from an analysis of 1,040 *post-mortems* are given in the lowest two lines of table II. It appears from these data that slightly over half the total *post-mortems* were in persons not over 30 years of age, which must, I think, be much greater proportion than in similar data regarding European countries, and the ages would average lower still but for the great rarity with which *post-mortems* are obtainable on native children. Moreover, the proportions above and below 30 years of age vary widely in the different races, the percentage over 30 years, (with a correspondingly high gall-stone rate), being lowest in

TABLE II

Age incidence of Gall stones in each race and sex

AGES	Hindus	Mahomedans	Europeans	Males	Females	Total	Schroeder's European figures
0-20	13	072	00	15	34	194	24
21-30	37	124	33	26	48	332	32
31-40	51	44	97	47	98	57	65
41-50	66	573	167	56	188	76	111
51-60	90	833	156	78	123	99	99
+60	185	175	308	154		222	252
TOTAL	49	39	107	405	81	537	
Ages in 1,040 post mortems { 0-30	54.6	46.7	32.8	49	60	51.8	
{ +30	45.4	53.3	67.1	51	40	48.2	

Hindus, namely, 45.4, highest in Europeans with 67.1, and intermediate in Mahomedans with 53.3 per cent. This factor should tend to raise the rate in Mahomedans as compared with Hindus, whereas we have seen that the former have the lower rate. This fact, together with the low gall-stone rate in Mahomedan women already mentioned, point to a real racial predisposition to gall-stones among Hindus as compared with Mahomedans. This lends some support to the view that a carbohydrate diet is more favourable to the production of gall-stones than a more nitrogenous one, for Mahomedans eat more meat than the Hindus. As 51 per cent of the total males were over 30 years of age against 40 per cent of the total females, the high incidence of gall-stones among the latter is not due to a higher average age of the women, the opposite being the case.

Of still greater significance is the much higher age rate of the European subjects, who show no less than 21.7 per cent of persons over 30 in excess of the figures for Hindus, which is certainly a factor, in explaining the much higher incidence of gall-stones among Europeans in Calcutta, in spite of their more highly nitrogenous diet. Nevertheless, the uniformly much higher incidence in each decade over 30 (the figures being calculated on the estimated number of subjects in each age period) clearly indicates a strong racial predisposition of Europeans in the tropics to suffer from gall-stones, as compared with the natives of the country. As many of these subjects belong to the Eurasian class (of mixed European and Indian blood) who are born and bred in India, it points to a racial predisposition as at least one factor in this high incidence. It has recently been suggested that gall-stones may result from bacillary infection of the gall-bladder after typhoid fever. If this were a common cause, the age incidence of gall-stone in India should be lower than in Europe in correspondence with that of typhoid as I have shown elsewhere, (4) but this is not the case.

SUMMARY OF THE FACTORS INFLUENCING THE INCIDENCE OF GALL-STONES IN INDIA

The conclusions derived from a study of these extensive data may be briefly stated as follows — (1) Gall-stones are quite as common in Calcutta as in England, if not more so. (2) They are twice as common in females as in males, both among the Hindus and in Europeans and in each age period quite irrespective of sedentary habits and such customs as tight lacing. The increase is most marked during the child bearing and climacteric period, pointing to its being due to some inherent sexual variation in metabolism. (3) In all races they increase steadily with increasing age, being rare below 30, and two to seven times as common above that age. (4) After making due allowance for the age and sex of the subjects, Mahomedans appear to be slightly less liable than Hindus, and Europeans considerably more so. (5) These racial differences do not appear to be fully explained by the commonly accepted theory that a carbohydrate diet favours gall-stones more than a nitrogenous one, for this factor should produce a lower rate in Europeans not a higher one. (6) None of the current theories will explain the sex and race differences, which therefore most likely depend on inherent metabolic variations of the precise nature of which we are still quite ignorant.

DISEASES MOST COMMONLY ASSOCIATED WITH GALL-STONES IN INDIA

On analysing the causes of death in cases in which gall-stones were found *post-mortem*, I was struck by the frequency of the occurrence of cirrhosis of the liver, even allowing for the greater frequency of that disease in tropical India than in temperate Europe, as I have recently shown elsewhere. (2) As granular kidney was also often associated with the fibrosis of the liver, I have analysed the frequency of pathological changes in both the liver and the kidneys in my gall-stone *post-mortems*, with the following remarkable results.

FREQUENCY OF CIRRHOSIS OF THE LIVER ASSOCIATED WITH GALL-STONES

In Calcutta it is an exception rather than the rule to meet with a perfectly healthy liver in the *post-mortem* room, vascular or degenerative changes, mainly of a fatty nature, being extremely frequent. The only condition of this organ, however, which was found to have been recorded far more frequently in gall-stone cases than in a general series, was some form or other of cirrhosis of the liver. In the total *post-mortems*, over 5,000 in number, this disease was returned as the cause of death in no less than five per cent, or five times as many as in Forster's series at Berlin, a proportion which would rise to over eight per cent if purely tropical diseases were omitted. In a further number of cases of deaths returned as due to

Other diseases, some degree, often considerable in amount, of cirrhosis was also met with. Altogether no less than 182 per cent of the gall-stone cases showed cirrhosis of the liver, in three-fourths of which it was of an advanced and characteristic degree. In 90 per cent it was of the ordinary multilobular hobnail variety, in three cases syphilitic and in one the intralobular form, which I have recently described as due to chronic kala-azar (2). In addition gummata, or then scars, were found in three cases. This is a much higher rate than is found in a general series of *post-mortems*, and appears to indicate some relationship between the two diseases. How far this may be mechanical dragging on the ducts due to contraction of the liver is uncertain, but this causation was mentioned in one record. The ages of the subjects showing cirrhosis of the liver was not materially above the normal, so the frequency of gall-stones in them is not due to that factor.

FREQUENCY OF GRANULAR KIDNEY ASSOCIATED WITH GALL-STONES

Still more striking was the frequency of granular fibrotic disease of the kidneys in the gall-stone series. Thus, I find that some degree of this change was recorded in no less than 40 per cent, in over half of which there was well-marked contraction of the organ. In the remaining cases an earlier stage of the disease was present, characterised by adhesions of the capsule, with granular roughness of the surface, and usually a diminished extent of cortical substance. As a fatal degree of granular kidney was only met with in 32 per cent of the total *post-mortems*, and even slighter degrees are by no means very common, these are most remarkable figures, and point to an undoubted relationship of this form of renal disease and the presence of gall-stones, which is only very partially accounted for by the fibrotic degeneration of these organs, increasing in frequency with advancing years, as is also the case with gall-stones.

The fact that two such intimately related diseases as cirrhosis of the liver and kidneys are thus found to be each so frequently associated with the presence of gall-stones, makes it impossible to doubt that their presence strongly predisposes to the formation of biliary calculi. The extensive destruction of the hepatic and renal secreting cells in fibrotic degeneration, necessarily produce marked metabolic changes, which may easily be conceived as altering the constitution and consistence of the bile in such a manner as to favour the formation of calculi, although I am not aware of this relationship having been previously pointed out.

FREQUENCY OF DISEASE OF THE GALL-BLADDER AND DUCTS DUE TO BILIARY CALCULI

In only 17 per cent or about one-sixth of the series, was any disease of the gall-bladder

or bile-ducts found to have been produced by the concretions. In 4 per cent the cystic duct was found to be completely obstructed or obliterated, and in a similar number the viscus had contracted down on the contained calculi. In 2 per cent the organ was distended with white bile-free fluid. In 5.4 per cent the wall of the gall-bladder was thickened, while in 0.9 per cent primary cancer of the viscus was present, while the same disease was present with dilated bile-ducts, but no calculus in another recent case. In 3 per cent serious acute inflammation of the gall-bladder was present, which was the cause of death in five out of the seven cases, the more interesting of which will be described below. Table III shows the frequency of these various lesions in a convenient form, more than one condition having been present in some cases.

TABLE III FREQUENCY OF DISEASES PRODUCED BY GALL-STONES

Gall bladder contracted	4	per cent
Do distended with clear fluid	2	"
Do well thickened	5.4	"
Cystic duct obstructed	4	"
Primary cancer of gall bladder	0.9	"
Cholecystitis or abscess of gall-bladder	3	"
Gall stones in hepatic ducts	18	"

The low proportion of pathological conditions caused by gall-stones in Calcutta thus shown is probably due to two factors. Firstly, the low average age of the subjects at the time of death already pointed out, which allowed of less time for the production of disease, which would especially apply to cancer of the gall-bladder. Secondly, to the size and nature of the gall-stones found.

SIZE AND NATURE OF THE GALL-STONES FOUND

In a considerable majority of the cases the sizes of the calculi were noted, and frequently also whether they were composed of bile pigment, of cholesterol, or of both, the latter nearly always showing a nucleus of pigment surrounded by a thick coating of cholesterol. An analysis furnished the following data on these points. In the first place, a single stone was found in one-fifth, and multiple ones in four-fifths. Secondly, on classifying them according to their size, it appeared that 8 per cent were very small grain-like multiple concretions, 36 per cent were about the size of a pea, 48 per cent, one or more reached that of a hazel-nut and the remaining 8 per cent were of a still larger size. In two instances a fused mass of stones filling the gall-bladder were noted. The single calculi averaged a larger size than the multiple ones, only 11 per cent being smaller than a hazel-nut, that is, about half an inch in diameter. Thirdly, among 74 instances in which the composition

was recorded, in 36 they were composed of pigment only, and the remaining 38 contained cholesterine, usually with a nucleus of pigment. Of the pure pigment calculi no less than 72 per cent were no larger than a pea, and only 28 per cent as large as a hazel-nut. Among the cholesterine ones, on the contrary, only 26 per cent were about the size of a pea or less, while 74 per cent were as large as a hazel-nut. Further, the cholesterine calculi were much harder than the pigment ones, the latter being usually readily broken down by very slight digital pressure. In my experience the small soft pigment biliary calculi are proportionately much more common in Calcutta than in London, and this probably accounts very largely for the low number of gall-stone subjects in India presenting pathological lesions as a result of their presence as shown in table III, and also for the small number of operations undertaken for cholelithiasis in this country.

ACUTE INFLAMMATORY CONDITIONS DUE TO GALL-STONES

With the exception of cancer, by far the most important and fatal lesions set up by gall-stones are of an acute inflammatory nature, which are worthy of close study on account of their amenability to surgical measures. The following cases from the *post-mortem* record are instructive from this point of view.

CHOLECYSTITIS

Inflammatory conditions of the gall-bladder alone were recorded in only four cases. In one which occurred in 1876, two ounces of pus were aspirated from the hepatic region, and two months later fatal acute peritonitis followed sitting up the sinus to improve the drainage. *Post-mortem* the liver was found to be free from suppuration, the abscess having been in the gall-bladder. The case illustrates the now generally recognised danger of aspirating the liver through the abdominal wall, and emphasizes the necessity of performing abdominal section for inflammatory conditions in this region. In one case suppuration in the gall-bladder was unexpectedly found in a patient who had died of extravasation of urine. In the remaining two, general peritonitis, secondary to acute suppurative cholecystitis, had been the cause of death, although produced in different ways. In the first, the fundus of the gall-bladder was closely adherent to the first part of the duodenum, which was almost perforated at this point, but the peritoneal adhesions had given way before the opening into the bowel had been completed, with a fatal result. The second case was one of very acute cholecystitis, in which the inflammation had spread through the wall of the gall-bladder without perforation, and caused general peritonitis. In this instance I isolated a virulent streptococcus from the bile-ducts in pure culture. The mucous mem-

brane of the gall-bladder was much thickened and inflamed, and showed petechial hæmorrhages. It contained a large stone, about one inch in diameter, together with several smaller ones. Pressure on the gall-bladder failed to force any bile into the duodenum until some firm adhesions about the cystic duct were severed, when it flowed fairly readily. The cystic duct (except at the adherent part) and the common and hepatic ducts were greatly dilated. The common bile-duct contained a stone $\frac{3}{4}$ of an inch in diameter, which could be passed down until it caused a bulging of the duodenal mucous membrane, but the orifice of the duct was not dilated. The hepatic ducts were greatly dilated within the liver, and distended with thin semi-purulent streptococci containing bile. The case was thus one of acute streptococcal suppurative cholecystitis and cholangitis, producing general peritonitis by spread of the infection through the intact wall of the gall-bladder. This is a very rare condition, as in twenty cases of suppurative cholangitis which I collected some years ago, and referred to in a paper on a case of this disease which I diagnosed and operated on in Calcutta in 1903, (3) I met with no similar instance, so it is worthy of record here.

Another case which may be mentioned was one in which a gall-stone was found encysted in a fibrous capsule outside the fundus of the gall-bladder, together with several other stones inside the viscus, and blocking up the cystic duct. There was no sign of recent inflammation, the patient having died of plague.

SUPPURATION IN THE BILE-DUCTS WITHIN THE LIVER SECONDARY TO GALL-STONES

Multiple biliary abscesses in the liver is fortunately a very rare disease in India, where its differentiation from amœbic and phylephlebotic suppurative hepatitis would be doubly difficult. In addition to the case above mentioned with pus in the intra-hepatic ducts together with acute cholecystitis, in two other cases multiple abscesses in the liver were recorded, accompanied with gall-stones in the hepatic ducts, composed of pigment in each case. In one of these there was also dysentery, and it is not quite clear from the report,—which was recorded in 1876,—which condition the abscesses were secondary to, although from the description it was most likely the biliary form. The other case was also complicated by dysentery, the commonest cause of death in the Medical College Hospital at that early date, 1876, but as the intra-hepatic bile-ducts contained both pigment calculi and yellow pus, the case was clearly one of suppurative cholangitis. In another case death from peritonitis was found to be accompanied by an enormous distension of the hepatic and common bile-ducts to the size of the small intestines, while they were filled with large faceted dark gall-stones, composed of pigment only, one being

the size of a walnut. The opening of the duct into the duodenum presented an ulcerated condition, and the bile-ducts throughout the liver were greatly dilated, and its substance firm from increase of fibrous tissue. The gall-bladder was much contracted on two small stones, while the cystic duct was entirely obliterated. It is in such a condition as this that the damage of the dilated and inflamed ducts by surgical measures is necessary, the occurrence of suppuration in the ducts being usually indicated by irregular fever and rigors with a polynuclear leucocytosis, and also sometimes accompanied by a decrease of the jaundice, at the same time that the general condition becomes worse. This last symptom is due to the suppuration loosening the obstructing gall-stones, and allowing the bile to once more enter the bowel, and is a most important diagnostic sign as I pointed out in the paper referred to above (3).

These are the only cases of suppuration in the intra-hepatic ducts in the thirty-five years' post-mortem records, amongst just over two hundred liver abscesses, so that they constitute only one per cent of hepatic suppurations in Calcutta. The very fatal nature of both these cases and of acute suppurative cholecystitis emphasize the importance of recognising and operating on them at as early a date as possible.

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PYORRHOEA ALVEOLARIS, FROM A TROPICAL STANDPOINT

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(Continued from page 370)

PART III—SEQUELÆ TREATMENT

Sequelæ—A good deal of attention is now-a-days devoted to the subject of Oral Sepsis, so that I need not enlarge here on its importance. The most prolific source of this condition is undoubtedly pyorrhoea alveolaris. The pus continually discharged is always being swallowed and inhaled, and this free supply may lead to absorption of septic material by the mucous membranes of the alimentary and respiratory tracts. Absorption into the blood of both bacteria and their products by the hyperæmic gum tissue in close relation to the affected alveoli is also possible.

Goadby describes as general symptoms of pyorrhoea alveolaris the following, as well as other less frequent conditions—Secondary anæmia, gastro-intestinal disturbances of a toxæmic nature, frequently associated with

neurasthenia, pigmentation of the skin, especially of the face, acneiform skin eruptions, and septicæmia. Depression, he says, often amounting to melancholia, is by no means uncommon, while general malaise and fatigue on slight exertion are common features.

Mr Baldwin Keyes regards pyorrhoea alveolaris as a factor in gastric neurasthenia, gastric hyperæsthesia, myasthenia, neuritis, pseudo-angina, gout, and diabetes, by systemic auto-infection.

Dr Savill, lecturing in 1902, instanced "ulcerative gingivitis" as a more frequently overlooked cause of neurasthenia than any other. He said that this and similar conditions probably act by constitutional absorption of toxic material swallowed, and the continual septic condition kept up in the alimentary canal. He had seen many cases of neurasthenia followed by a speedy recovery when these conditions had been removed.

Smale and Colyer give septic absorption from diseased conditions of the teeth as a cause of general debility, infective gastritis, and diarrhoea, and quote accounts by Mr Rickman Godlee of cases pointing to the same cause for attacks of bronchitis and pleurisy. They suggest that "the infective nature of many obscure conditions, such as osteomyelitis, suppurative meningitis, ulcerative endocarditis, and acute nephritis, will in some instances be shown to be traceable to the teeth," and refer to a series of articles communicated to "The Lancet" by Dr W Hunter dealing with the disease known as "pernicious anæmia." Dr Hunter then regarded it as "a chronic infective disease arising from absorption in some part of the gastro-intestinal tract." The infection, he considered, "in nearly all cases has its origin in the mouth, the immediate cause being either the teeth or a stomatitis of septic origin."

Oral sepsis is given by several authors as a cause of appendicitis. Mr J H Dauber, speaking in January of this year, described two or three cases of appendicitis due to septic conditions of the teeth, and said "My experience in the out-patient department of this hospital (Hospital for Women, Soho) is that dyspepsia, gastritis, and enteritis, when they are chronic, are closely connected with, and are probably due to, faulty dental conditions."

The possibility of puerperal fever being due to dental infection is suggested by Dr Forbes Ross in a communication to the *British Medical Journal*, 14th March 1896 (Smale and Colyer).

"Oral sepsis is regarded by Dr Hunter as a cause of certain forms of neuritis. He records three cases (*Practitioner*, December, 1900,) in which immediate improvement of the neuritis followed treatment of the septic condition of the mouth" (Smale and Colyer).

Goadby says "A number of the different varieties of bacteria found in diseased conditions

of the lung may be derived from the oral secretion"

An article in the *Indian Medical Gazette*, August, 1905, by Major F O'Kinealy, IMS, strikingly illustrates the extent to which oral sepsis prevails in India, and it is noticeable that the writer attributes the condition in the cases coming under his observation to "unhealthy or spongy gums," and pyorrhœa alveolaris, and as a diagnostic sign utilises the same symptom as that regarded as characteristic by Goadby—"bleeding of the gums"

The opinions expressed by this and other writers in the *Indian Medical Gazette* indicate that the conditions found in the mouths of prisoners in jails are much less often symptomatic of scurvy than was formerly supposed, and that the oral condition of prisoners in jails is fairly representative of that of the classes from which they are drawn

The chief conditions consequent on the gingivitis, pyorrhœa, etc., in Major O'Kinealy's patients were diarrhœa and dysentery. The general health also suffered, and oral sepsis was markedly present in case of respiratory disease

Major O'Kinealy makes some suggestive remarks as to the *manner* of the infection in the case of dysentery, from which one may gather that, in the case of a specific disease, the pyorrhœic infection may be causal by lowering the resistance of the tissues and may also increase the virulence of the bacterial intoxication by superposing a pyogenic upon a specific infection. The influence of oral sepsis in the etiology of lung disease, and especially in that of tuberculosis, is well-marked in the statistics given

In my own practice I have remarked the cure or relief of many cases of dyspepsia and allied conditions, several of neurasthenia, and one of melancholia, by treatment, chiefly radical, of pyorrhœa alveolaris. One case may be of sufficient interest to mention. The patient was a Brahmin, who had rather far advanced pyorrhœa affecting all the teeth. He suffered from considerable mental depression and anæmia, and the pigment in the skin of his fingers receded to about half an inch or so beyond the nail, also there was less pigment in the palm, this being especially noticeable on the thenar. After the teeth were removed he got much better, both physically and mentally, and when I saw him a few weeks afterwards, the pigmented condition had returned nearly to the nails, and the palm was normal in appearance

With regard to other sequelæ, the loosened condition and eventual loss of the masticatory organs is a serious matter, and minor consequences, as æsthetic ill-effects, and so forth, are to be considered

Treatment—Consideration of the treatment of chronic suppurative dental periostitis naturally ranges itself under four heads—

1 Prophylactic

2 Palliative

3 Curative

4 Radical

1 *Prophylactic Treatment*—General prophylaxis is largely the province of the physician, and it is unnecessary to do more than refer to it here. One imagines that a well-regulated life, with due attention to diet, and also to personal cleanliness, would have a very great effect, especially as regards the native community

With regard to the prevention of *local irritants*, tartar should of course be removed at regular intervals by the dental surgeon, and the occurrence of other irritating conditions forestalled by the avoidance of deleterious habits, by the exercise of due care in conservative treatment, by the use of a correct and effective tooth-toilet, and where specially indicated, by the employment of an antiseptic mouthwash

2 *Palliative Treatment*—I have so termed the treatment described under this head, as, though such treatment may result in a cure in mild cases, or when assisted by improvement in general health, it can usually only result in the amelioration of symptoms, local and general and in prolonging the life of the teeth

The treatment of any constitutional dyscrasia that may be present, general tonic and alterative treatment when necessary, and inculcation on the patient of the importance of his co-operation should of course precede any attempt to treat the condition locally

Smale and Colyer say "Where any chronic condition exists, such as diabetes or chronic nephritis, there is but little chance of effecting a cure, the utmost that can be hoped for is to lessen the activity of the disease" Mr C M Wright (*Dental Annual*) says that curability is dependent largely upon the appreciation of laborious, persistent and prolonged attention, with intelligent, constant watchfulness, failing which radical cure by extraction is preferable to mere palliation and continued injury to general health. N N Znamensky says that, in the *earliest stages* pyorrhœa can be arrested by very thorough hygienic treatment and correct regimen of diet

—All tartar and other accumulations must first be carefully removed from the surfaces of the teeth and from the gum pockets, and the teeth kept clean by correct brushing and the use of a slightly detergative preparation. Food should be thoroughly masticated and the teeth kept in constant, steady use. Healthy action may be stimulated by regular massage of the gums by the fingers, and by the use of astringent mouthwashes, Kress and Owen's "Glyco-Thymoline" being very useful for this purpose. —Tincture of iodine (double pharmacopœal strength) and tincture of aconite (Fleming's), equal parts, may be applied to the inflamed gums

Major O'Kinealy got good results from the free local application of liquor iodi fortis (B P)

Stomatitic conditions, when present, and dental caries, etc., should be treated, and all very loose teeth removed.

In direct treatment of the suppurating socket Messrs Baldwin-Keyes and Bradner-White adopt the following procedure—After removal of deposits and mechanical cleansing, aromatic sulphuric acid is applied on flattened wood points, followed immediately by sodium bicarbonate. Silver preparations are then applied in a similar manner, either a saturated solution of silver nitrate, melted crystals, or "argentum" (Schering), the latter commencing with 10% sol., increasing to 20% (Dental Annual).

Sinclair and Colyer recommend that the pockets formed by the loss of the alveolar bone be thoroughly irrigated with an irritating antiseptic solution, e.g., hydragryl perchloridum, 1 in 1,000 or hydrogen dioxide, 20 vols., every day until healing occurs. If at all intractable, a solution of trichloroacetic acid (25%) should be applied to each socket on a thin, wedge-shaped piece of wood. This treatment usually results in a marked improvement in the course of three weeks.

Powdered tannic acid may be packed into the pockets in the same way.

A method of utilising the oxidising properties of hydrogen dioxide is to pack the gum pockets with sodium dioxide and aromatic sulphuric acid, hydrogen dioxide is then liberated *in situ*. Or if citric acid is used instead of the aromatic sulphuric, the liberation of hydrogen dioxide is hastened.

The hypodermic injection of mercuric chloride into the gum at the base of the pockets has been recommended.

If the disease will not yield to treatment of the nature above suggested, the gum pockets may be packed with a mild escharotic, such as powdered copper sulphate on a thin slip of wood moistened with aromatic sulphuric acid, or a 25% solution of trichloroacetic acid.

These and similar measures, when thoroughly carried out, will give very fair results if too much is not expected of them. An essential factor in such treatment is to remove all the badly affected teeth, as in no case can a tooth be saved by these means after its condition has passed a certain stage, and that stage will probably be found to be when enough of the alveolus has been destroyed to bring about definite loosening of the tooth, that is, loosening due to the loss of the bony support as distinguished from loosening due to oedema of the inflamed periosteum. The presence of the teeth which have reached this stage owing to the amount of suppuration going on around them, is inimical to the recovery of those in which the disease has not so far advanced, and of course is specially dangerous to those that are still sound.

These measures, and especially the earlier described hygienic and antiseptic treatment such

as may be carried out by the intelligent patient, will not only tend to preservation of teeth, but, if regularly kept up, will lessen or altogether prevent the constitutional effects of the disease.

Direct treatment of the alveoli is necessarily a tedious and lengthy affair, and requires the devotion by both patient and operator of a great deal of time and patience, to which neither is often much inclined, and the results are frequently disappointing. Treatment with caustics I have found specially so, as it often appears to aggravate rather than improve the state of affairs by lowering the resistance of the tissues to the micro-organisms, which undoubtedly have the upper hand so long as the pockets are present.

3 Curative Treatment—I include treatment by Electrolisis under this head, as, owing to the thorough permeation of the tissues by this method of application, the drugs used should attain optimum efficacy.

Mr Dence Whittles (*British Dental Journal*, 15th January, 1908) states that he has "succeeded in obtaining very excellent results by using a glycerine solution of protargol, and applying this in conjunction with an alternating primary current of a low potential."

Mr E Sturridge (*British Dental Journal*, 1st February, 1908) prefers a continuous to an alternating current, as being more in accordance with the idea of cataphoric medication. He uses argyrol, as, though less bactericidal than protargol, it has a bland, soothing effect, and is mildly astringent. He considers silver nitrate next to useless in the treatment of pyorrhea. The drug he finds most efficacious in connection with the electric current is—Iodini gr. iii, Potassii Iodidi gr. x, Aq. destil. mxxx, Glycerini ad fl. oz. ss.

Some of the most important recent pronouncements on curative treatment present three main features: fixation of the loose teeth, destruction of the suppurating pockets, and vaccine therapy.

Mr E Sturridge, in a paper read before the Odontological Section of the Roy Soc of Medicine in March, 1908, says "we are all aware of that condition which arises in consequence of this disease by which teeth affected by pyorrhea leave the normal position, protrude with interspaces, and become loose. In that abnormal position no amount of treatment will be productive of any permanent good results. On the other hand, if such teeth are replaced in normal apposition, and retained there, satisfactory results may be expected."

Mr Sturridge's method is to bring the teeth back into their normal position, and hold them there by means of permanently fixed wire staples. By combining this method of fixation with cataphoric treatment he has succeeded in retaining teeth for many years. The pockets were practically obliterated, the gum closing up tightly round the teeth, but owing to non-regeneration of bone there was no re-attachment of gum to the cementum.

It is noteworthy that operators who do a great deal of bridge-work maintain that, after the attachment of a bridge to pyorrhœic teeth and roots, a very marked improvement, in some cases amounting to a cure, results. Even such support as is provided by a removable denture will very often assist greatly in improving the condition of such pyorrhœic teeth as remain.

The experience of other practitioners has confirmed the great value of cataphoresis combined with fixation.

In Mr Goadby's lecture before quoted he says "It is useless to preserve the gum and other tissues above the level of the bottom of the pocket, for, if the pocket be allowed to remain, it only becomes the site of fresh infection and the recommencement of the disease in tissues already weakened by the diseased process. On broad general lines the alveolar pockets should be eradicated, a process that is best performed by means of the electro-cautery only a few, at the most three, teeth being treated at a single sitting."

Vaccine therapy has been practised by Goadby and others in the treatment of alveolar pyorrhœa in combination with local applications, curetting, electrolysis, etc.

Whatever the local treatment employed, so long as lowered resistance to the infective organisms remains, the disease is liable to continue, or, after apparent cure, to recur from time to time. "These facts," Goadby remarks, "and the consideration of the bacteriology of the disease, point to the urgent want of some method by which the general as well as the local infection may be attacked." After such severe operations as curetting and cauterisation the constitutional symptoms are likely to be exacerbated for a time, and Goadby considers that extensive operations of this nature should not be undertaken without "previously raising the general resistance of the patient to the infecting organisms."

Goadby's method is to prepare a vaccine from the organism or organisms isolated from the case under treatment which give the lowest opsonic index. A suitable quantity, according to the patient's opsonic index, is injected at the lower angle of the scapula, and the dose increased at subsequent injections as may be indicated. The effect of the negative phase must be allowed to pass away and the positive phase awaited before local treatment is commenced. "Curetting and cauterisation are then unlikely to cause infection."

Goadby's conclusion is "The infection has been traced to its causative agents by means of the opsonic index of the individual's blood to organisms obtained from the local disease, which points clearly to the origin of the lowering of the general resistance of the individual, and the increased susceptibility of the whole of the body favouring secondary invasions."

The knowledge obtained of the lowering of general resistance to certain organisms gives a method of treatment somewhat laborious no doubt, but giving a logical and practical method of dealing with the disease."

Dr T J Holder claims to have found specific inoculation successful, and says "Show me now a patient who is suffering from pyorrhœa alveolaris due to streptococcus salivarius and I know how to treat him with fair promise of success."

Messrs D W Caimalt-Jones and J E Humphreys have also had good results. They "believe that pyorrhœa alveolaris can, in some cases at any rate, be much improved and even cured by the use of vaccines made from bacteria isolated from the pus."

4 *Radical Treatment*—Radical treatment of pyorrhœa consists in the extraction of all the teeth, when in the great majority of cases a complete cure results. The alveoli heal by granulation, all foreign matter and inflammatory products being extruded, and the mucous membrane closes over the surface. The edges of the socket become absorbed and then apices filled up by new bone, and the border of the alveolar process is more or less rounded off, as usual after the loss of teeth. Of course the customary antiseptic precaution should be taken until the tissues have completely healed.

Goadby, however, says that the general symptoms may continue for some time, and that it is advisable to remove a few teeth only at a sitting, or, if the whole dentition be removed at once, to raise the opsonic resistance beforehand by inoculation.

There is much yet to be learnt by study of this very refractory disease, and it may be hoped that in the future extension of our knowledge thereof observations carried out in this country will contribute not the least valuable share.

In the meantime the report of Mr Goadby's paper on "Acute Pyorrhœa and Its Treatment," which was to have been read before the Dental Section of the British Medical Association on July 31st, may be read with interest.

A Mirror of Hospital Practice.

SPINAL ANALGESIA

By A CHALMERS,

CAPT, I.M.S.,

Dist Medical Officer, Trichinopoly

THE following cases with remarks thereon and some details of technique may be of interest.

The substance used for injection was in all cases A E Barker's Stovaine 10%, Glucose 5%, distilled water 85%. This compound was obtained in sealed ampoules from Kiolinet Legeman, London. The cost comes to Rs 6 per dozen ampoules or about 8 annas for each case.

which compares favourably with C H Cl₂. The syringe used was that known as the Record with a capacity of 2 c cm. The needle employed has a close fitting stylet. The point is hollowed out, thus securing sharpness without lengthening the terminal opening too much. A slender canula fits this hollow needle closely and projects about 1 mm beyond its point when pushed home inside the hollow needle. The puncture is made with the needle (with the stylet *in situ*), as soon as the needle has passed the supra and interspinous ligament, the stylet is withdrawn and the needle pushed on. Finally, there is a sensation of puckering a tense membrane and the spinal fluid flows out as a rule rapidly either in drops or continuously. When about 10 c cm have escaped, the *canula already attached to the charged syringe* is pushed home through the *hollow needle* and the compound injected very slowly. The needle, canula and syringe are withdrawn and the puncture sealed with collodion. As regards the position of the patient during and after the puncture it was found much easier to inject the patient sitting on the edge of the table with his head well bent forward on to his knees. Then, if merely perineal anaesthesia was required he was laid on his back immediately after injection with a pillow under his head. But when a higher anaesthesia, say up to umbilicus, was necessary, the patient was laid on his back with a *sand bag under his buttocks* and two or more under his head. The result was the canal formed a curve with the lowest point about the *lower dorsal region*. This is important if one wishes to obtain a high analgesia.

The needle, canula and syringe were sterilised before and after by boiling them in distilled water in a special steriliser obtained for the purpose.

In the patient's skin after the usual washing and use of disinfectants—normal sterilised salt solution was freely used.

The puncture was made between second and third lumbar vertebrae as it was found easier in this interspace than between third and fourth. One point was noticed that gave rise to some confusion at first and led to some failures. If one marks out the exact site for puncture when the patient is erect and then punctures over the site marked, it will be found that the needle will strike against periosteum or bone. The spinous process is slightly tilted up, hence the result. This can be avoided by waiting till the patient has *well bent forward*, when if one places a finger over each process, the site for the puncture is accurately determined. It is important to get the patient to keep his spine quite straight in the vertical line. No doubt it may sound the easiest thing in the world to enter the canal every time, but it is not so in reality until one has had a little experience. To get some practice the writer induced some twenty patients to submit to lumbar puncture with no further end in

view (than puncture). After these cases in which I had no less than 8 failures (at the first puncture) I tried my first injection.

Case 1—Infective Granuloma of Vulva—Entered canal at second puncture—spinal fluid flowed in rapid drops—6 c cm removed. Analgesia up to iliac crests in four minutes. Loss of all reflexes up to this level. Motor paralysis ditto. Patient quite comfortable. Analgesia lasted 1 hour and 25 minutes. After effects nil except slight headache. Patient had had C H Cl₂ previously and said she preferred this method. [2 c cm of Stovaine and Glucose injected.] Anaesthesia was perfect, deep dissection and thermocautery.

Case 2—Amputation of Penis for Cancer—Male, aged 65—weak—c s fluid escaped in rapid drops one drachm removed—2 c c of Stovaine sol injected. Analgesia in 3 minutes—operation began after 4½ minutes. Slight sensation on cutting suspensory ligament. Otherwise satisfactory. Duration of analgesia 50 minutes. No after effects except slight headache which lasted 6 hours, but was never severe.

Case 3—Hydrocele—Radical cure—size of a coconut. Analgesia in 4 minutes in scrotum and perineum up to a s s in 8 minutes. Duration of analgesia 65 minutes. No after effects. Injected in sitting posture laid flat on back with head well raised. Patient was astonished to find operation completed.

Case 4—This was a curious case. Patient, a male, aged 58, complained of severe pain in the scar of an old operation, wound situated over linea alba above umbilicus in which was a small discharging sinus. There was much thickening and the mass felt like a tumor. On cutting down a hard substance was felt, and this proved to be the ends of an old silver wire suture embedded in the abdominal muscles. The ends were untwisted, cut with plier and the wire removed—the wire was nine inches long (No 7 thickness). The track was cleaned and swabbed with Zn Cl₂.

This patient was turned on his back at once after injection with his hips and head elevated. Anaesthesia complete up to epigastric. The wire had been inserted 15 years ago by Colonel —, I.M.S., in Hyderabad. No after effects.

Case 5—Removal of Extensive Cancerous Glands in both groins

Laid on back with hips and head well elevated. Complete analgesia up to a s s in 8 minutes, very large and deep dissection, operation lasted one hour, analgesia passed off in 1 hour and 50 minutes. No after effects.

Case 6—Hydrocele—Radical cure, result perfect, no after effects.

Case 7—Hydrocele, R—Radical cure. A very nervous patient of 23 years, nearly fainted when needle introduced. *Bilious vomiting 20 minutes after injection* just as operation was completed. Had rather severe headache for 3 hours.

Case 8—Hydrocele—size of very big coconut, second puncture necessary—had the least inconvenience, and although patient was nervous he was delighted with result. No after effects.

Case 9—Large R Hydrocele—Size of a large coconut. Puncture made with patient sitting up, rapid escape of cerebro spinal fluid—5 iss withdrawn—2 c c of Stovaine sol injected. Patient turned on right side with head and buttocks elevated. Operation begun 4 minutes after injection, perfect result, no complaints and patient was loud in his praises of the method. Analgesia up to 1" below umbilicus. No after effects.

Case 10—Elephantoid Vulva—Woman, aged 40. The analgesia was rather slow in developing in this case, no motor paralysis till 10 minutes had elapsed, operation started 4 minutes after injection. There were no ill-effects except a slight headache, result very satisfactory, 2 c c injected as usual, patient laid on her back

after injection made in sitting posture Upper limit of analgesia was line between ant sup iliac spines

Case 11 — Removal of suspected malignant tumor from L groin of a woman aged 40 This woman had been operated on some months ago for an infective granuloma of vulva (removed under spinal analgesia) The parts had healed, but the inguinal and femoral glands were enlarged and tender Free incision from spine of pubes to ant sup iliac spine and tumor dissected out with glands, etc Result very good but patient was very nervous and had, or at least she thought she had, slight pain near the close of operation

In this case the patient was turned on her left side and the injection made in that position Analgesia up to mid way between umbilicus and epigastric angle No after effects, patient quite pleased

Case 12 — Radical cure, L Inguinal Hernia—man aged 25, very nervous and complained of the puncture, injection with patient on left side and buttocks elevated Analgesia up to epigastric notch in 6 minutes Patient suffered from nausea and felt faint for a few minutes (3 minutes after injection), given hot coffee with Brandy which relieved him Operation begun 5 minutes after injection quite satisfactory till skin sutures inserted when he felt slight uneasiness not amounting to actual pain Operation lasted 45 minutes Bassini's method

These results have encouraged me as to the safety and efficacy of the procedure, and I hope to publish a further set of results shortly The necessary outfit consisting of Record Syringe in nickel case and steriliser can be got from Kiohnet Legeman, London, for about Rs 40

A CASE OF BLOOD CYST OF THE PERITONEUM

By R F HEBBERT

LIEUT, I M S,

Offg Medical Officer, 18th Infantry, Medical Officer in charge, Cantonment General Hospital, Benares

PATIENT, a Havildar, 18th Infantry, aged 33, came to me on June 19th, 1908, complaining of pain in the stomach He was at Musketry practice when he felt a sudden sharp pain in lower part of the abdomen and said he then noticed a lump He had had a hernia on that side some three or four years before and thought the lump was appearing again There was no diarrhoea or constipation on examination, there was a hard cystic tumour in lower part of abdomen rather to right of mid line and extending to within two fingers breadth of umbilicus above

The abdomen was rigid over it and it was painful on palpation I thought at first it might be an appendix abscess, but there was no bowel trouble and his constitutional symptom did not seem severe enough for an abscess His temperature was 100.8 rising to 102.4 in the evening He had vomited once

I put him to bed with a milk diet and gave him a dose of castor oil, and ten grains quinine three times a day, with a hot poultice over tumour.

The next day the tumour was much less tender and the abdomen less rigid over it He had vomited once

The next day the tumour was practically painless on pressure and could be felt more definitely The temperature remained ranging between 101—102° I thought this could not be due to the tumour, but urged the man to let me remove it This he consented to do

On June 22nd I opened the abdomen, all instruments, ligatures and dressings being boiled in the sterilizer lent me from the station hospital

I made a vertical incision downwards over the tumour over the right rectus muscle The rectus sheath having been incised, the rectus was deflected and the peritoneum opened

A large cystic tumour very tense on palpation then appeared (At this moment patient stopped breathing, so I was compelled to hastily cover up wound and resort to artificial respiration In four or five minutes patient resumed breathing and afterwards stood the operation well) I am afraid this rather upset the asepsis of the operation I then tapped the tumour with a trocar and canula when over a pint of dark red fluid was evacuated I was then able to investigate the tumour and found it was a large cyst springing from the right iliac fossa close to the brim of the pelvis I tied the pedicle in the same way as for ovariectomy and excised the tumour which shelled out quite easily

The peritoneum was sown up by a running silk suture, and the skin and rectus sheath by interrupted silk sutures The wound was dressed with dry gauze and the patient put back to bed

The patient was rather restless at night, so I gave him an injection of morphia Curiously enough, the temperature came down by lysis to normal within two days of operation The stitches were removed on the 10th day when the temperature had begun to rise again slightly

I found a stitch abscess had formed at the upper and lower sutures, the lower one soon closed on opening it out, but the upper persisted for a long time till the deep suture worked out when abscess closed The rest of the wound healed by first intention

Patient is now quite well and proceeded on sick leave

On examining the tumour I found it consisted of a fibrous wall on the inner side of which was a velvety dark layer looking like blood clot I had the wall examined at Kasauli and it was reported on as consisting simply of fibrous tissue

I look on the case as one of the rare tumours of the abdomen—a simple serous cyst of the peritoneum, and I think probably the pain was due to injury to the cyst causing bleeding into its interior, converting it into a blood cyst The cyst must, of course, have been present some months before patient became aware of it.

FIG I



FIG II

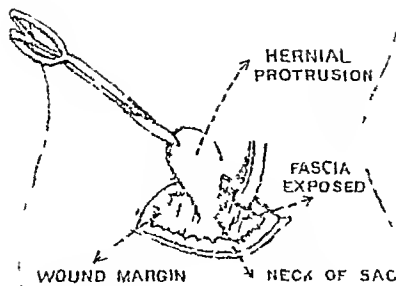


FIG III

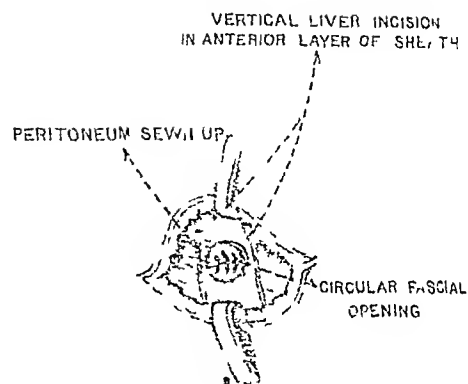


FIG III A

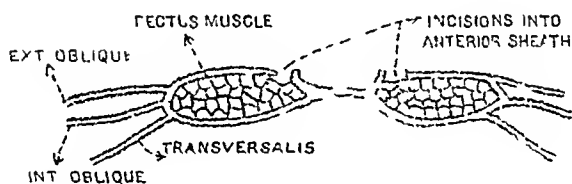


FIG IV

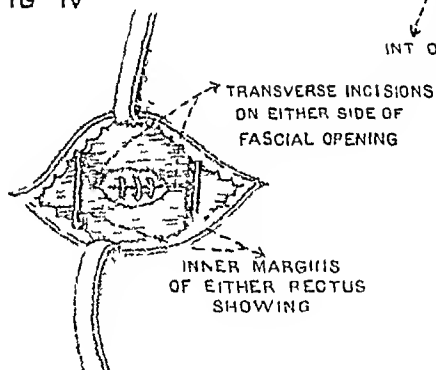


FIG V

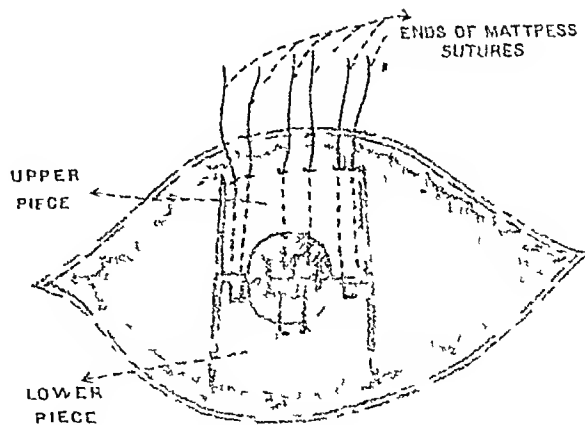
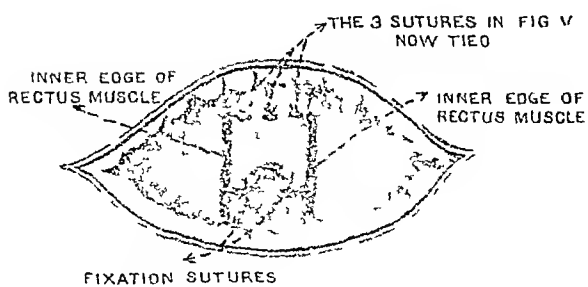


FIG VI



A CASE OF PNEUMOTHORAX

BY A H NAPIER,
LIEUT, I M S

I SEND these notes on the following case as I think they are of some interest

Patient admitted into hospital, 10th August 1908, complaining of weakness and emaciation of four months' duration and of pain coming on acutely that morning

Previous History—The patient's name is Sher Ah, age 23. He enlisted as a piper in the regiment on 4th February 1908. On the regiment being ordered to the front, he came to the hospital complaining of weakness, and the following entry is found in his Medical History Sheet

Admitted 27th May 1908, discharged 2nd June 1908, "Bronchitis" Recovery. No history of previous illness elicited

Present Illness—Patient states that he has been ill for four months suffering from weakness, wasting and pain in the right shoulder. He had a slight cough but did not spit much. He never had hæmoptysis. On day of admission while at stool he felt a sudden fairly severe pain in the right shoulder. He did not faint and walked back to his quarters where he lay down. He lay there most of the day, but went out for a little in the evening. He found he could not walk far, so came to hospital complaining of "fever"

Present Condition—On the morning of the 11th patient looked decidedly ill, sitting up in the bed with forward stoop and breathing rapidly. Patient's face is pinched and there is a distinct malar flush. He is somewhat cyanosed, his face is moist, skin clammy and his pulse is weak and fast. He coughs silently and weakly and is not eased. The cough is paroxysmal and accompanied with a fairly copious spit

Patient is much emaciated and his ribs stand out. His breathing is rapid and shallow rather than laboured, and the right side of the chest is immobile. On the right side the intercostal spaces are bulged

The heart's apex beat is visible, $5\frac{1}{2}$ " from middle line outside left nipple. On measuring the chest's circumference through nipples and below scapulae the right side measures $17\frac{1}{2}$ " and the left $16\frac{1}{2}$ "

To percussion, palpation and auscultation the left lung is normal and no crepitations were detected, although carefully looked for on several occasions. On the right sides—Percussion note is tympanitic

V F diminished V R was curiously increased and sound seemed to be close under stethoscope

R M distant and faint, but beautifully amphoric. No crepitations detectable, but at the end of inspiration distinct splashing sounds were heard of fluid falling from surface of lung through the pleural space

"Bell" sound easily elicited

"Succession-Splash" not tried for

The spit was heavy yellow and not frothy, and teemed with tubercle bacilli

Heart—Apex beat visible in 5th interspace $5\frac{1}{2}$ " from middle line. Cardiac dullness measured $4\frac{1}{2}$ " transversely and the superficial and deep areas of cardiac dullness were practically similar as if the heart were pushed forward and bounded on right by air which could not be palpated through

The heart sounds are regular, rapid and there is no murmur. The second pulmonary sound is louder than the first. The pulse is soft, thready, regular and rapid, numbers 120—and beats to the minute

Liver—Liver dullness obliterated by air in pleura as far as costal margin. The lower border of liver is palpable $1\frac{1}{2}$ " below costal margin. Its edge is firm and regular

Urine—Not examined. Other organs normal

Progress of case—Next day, 12th August, 1908, signs as before

On 13th, lung signs on right side had altered. At back the percussion note is duller. V R and V F diminished

R M hardly audible and splashing sounds absent. On 17th, signs as on 13th. Patient left hospital feeling easier. He was discharged from the regiment at his own request

Treatment—Morphine, stimulants and fluid diet. He was kept isolated on the verandah

The question of aspirating air and injecting Adrenalin into pleural cavity was kept in mind but not acted upon as his symptoms were not acute enough

The points of interest in the case are as follows—

1 Occurrence of Pneumothorax to such a marked degree with few acute symptoms. This is due to freedom of left lung from disease

2 Left lung free from disease. A clinical rule that I have been taught is—"If one of two bilateral organs is much diseased, then the other is or will be affected"

3 Alteration in signs on 3rd day in hospital due possibly to closure of the opening between the cavity in the lung and the pleura

4 Patient was a piper and played a native pipe with reed mouthpiece. Scrapings were taken from the reed and stained for Tubercle Bacilli by Ziehl-Nielsen method. In all slides round cells, staphylococci and pneumococci were found

In two slides TUBERCLE BACILLI were found

5 The diagnosis typically easy from the displacement of heart and liver, there being no question that the case might be emphysema or a large cavity in the lung

6 The altering signs corresponding to the two types of signs described in books

I am not able to complete the notes either by post-mortem examination or by noting the termination of the case as the patient has gone to his own home

A METHOD OF OPERATING FOR UMBILICAL HERNIA

BY J HAY BURGESS, M B, F.R.C.S.,
CAPTAIN, I M S

ALTHOUGH certain steps of the method below described have been used by certain operators for Umbilical Hernia, for instance, the Brothers Mayo in the Mayo Operation, I have never seen or read of all the steps being undertaken as I here detail them

Step I—The skin incision is transverse in direction and encircling the neck of the hernia in an ovoid manner. This incision need not be huge as the skin in this region can be so readily retracted that quite a large field can be exposed in any direction by the judicious use of Retractors—Fig I

Step II—The incision is then deepened and the linea alba and fascia freely exposed vertically, transversely and in every direction. The neck of the sac is carefully defined. The

peritoneum is then carefully separated from the opening in the fascia. By inserting a finger in this opening the peritoneum is also separated from the posterior layer of the rectal sheath for about the distance of an inch or so from the margin of the opening all round—Fig II

Step III—The sac is then opened, the contents reduced and the major part of the sac with covering skin cut away. The opening in the peritoneum is then sewn up—Fig III

Step IV—The anterior layer of the rectal sheath is then opened vertically on either side, about $\frac{1}{2}$ inch outside the inner margin of each rectus abdominis muscle, and the rectus separated from its anterior and posterior sheath layers—Fig III & Fig III (a)

Step V—The neck of the fascial opening is then cut transversely on either side for a short extent into the fascia on either side, i.e., post sheath layer and inner margin of cut anterior sheath layer. As the peritoneum has been separated here, *vide* Step II, the peritoneum is not cut. Then mattress sutures with both ends threaded on to needles are inserted into the upper edge of the lower piece of fascia thus formed from behind forwards, and then, after passing behind the upper piece, through it from behind forwards, a slight distance from the margin, thus drawing the lower piece beneath the upper piece. The lower margin of the upper piece is then sutured by a couple of sutures into the anterior surface of the underlying lower piece. Fixation Sutures—Fig IV, Fig V and Fig VI

Step VI—The inner margins of the anterior sheath are then united by sutures. This margin will be slightly doubled on itself where Step V was undertaken. Fig VII & Fig VII (A)

Step VII—Mattress sutures are then inserted through the inner margin of the left rectus and then through the right rectus some distance from the margin, thus making the right rectus overlap the left. To do this comfortably the incision into the anterior sheath in Step IV must be free—Fig VIII, Figs IX & X (a)

Step VIII—The anterior sheaths or rather their outer cut margins are then sewn together—Fig IX & Fig X

Step IX—The skin is sewn together—Fig XI

For the opportunity of carrying out this operation and for his valuable assistance, I have to thank Colonel Thompson, I M S, and for help in preparing the diagrams, Lt O Berkeley Hill, I M S

LIVER ABSCESS IN A FEMALE

By DEBENDRA NATH GUPTA, L M S

Medical Officer, Bahari Lal Mukherjee Dispensary, Banchni, Hughli District

S, a Musalman female of respectable family, was operated on for liver abscess by me during

the first week of September 1905. She recovered gradually, the wound being healed by the middle of December.

She was again brought to the hospital on 28th April 1908. She stated that, about a month previously, she got high fever with rigors, and pain in the right hypochondrium. The fever continued, though after about twelve days its height diminished, the pain increased, and profuse perspiration reduced her strength, she felt nausea and frequently vomited, and her eyes became jaundiced.

No history of drink or dysentery, but has suffered from repeated attacks of malarial fever. No specific disease.

Present condition—Bowels constive, face waxy, eyes jaundiced. Heart normal, spleen not enlarged, slight cough, and no sign of disease in lungs. Temperature varies from 99 in morning to 101 in evening, was 99.8 at time of operation. Scar of previous operation visible in right hypochondrium, where the skin pits on pressure, and an indurated ring can be felt round a central soft swelling. Bulging extends from costal arch to a little above umbilicus.

Under antiseptic precautions, an incision, about three inches long, was made in the centre of the swelling, which was adherent to the abdominal wall, and carried into the abscess. About a pint of reddish pus was evacuated, the cavity was washed out with douche, a drainage tube inserted, and antiseptic dressings applied.

The wound was dressed daily at first, then at intervals of two and three days. In four weeks the cavity had almost filled up, a small sinus took twelve days longer to heal. Fever abated within two days, and entirely ceased in five days. At first stimulants and nourishing diet were given, afterwards tonics, quinine and nut vomica. Within two months after the operation she had quite regained health and strength.

Remarks by Lieut-Colonel D G Crawford, I M S, Civil Surgeon, Hughli. Liver abscess is a common disease in Lower Bengal. Probably at least half the cases which are operated upon, either in hospital or outside, terminate fatally, and I presume, all those which remain untreated. Liver abscess in women is, I think, decidedly uncommon. Out of 23 cases which I have myself operated upon, only two were in women; and out of 18 other operated upon at Chinsura during the last fourteen years, all were males. A case of liver abscess, occurring twice in the same woman, and twice operated upon with success, must be decidedly rare. The interval between the two operations, over 2½ years, is so long, that recurrence could hardly have been due to imperfect recovery from the first operation.

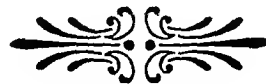


FIG VII

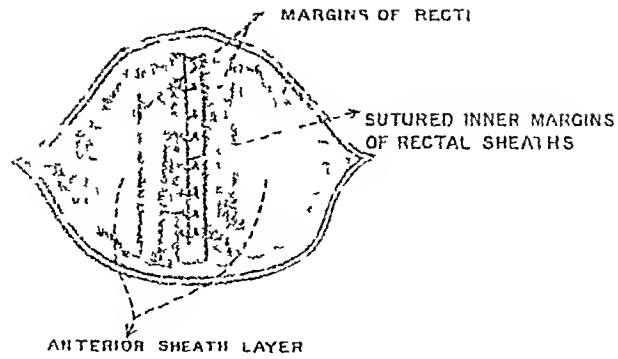


FIG VII A

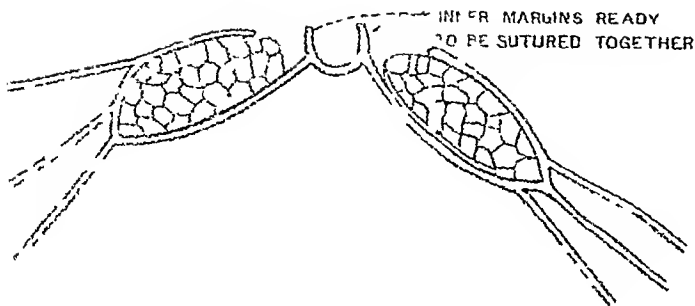


FIG VIII

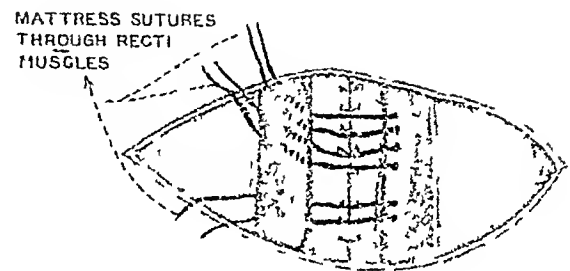


FIG IX

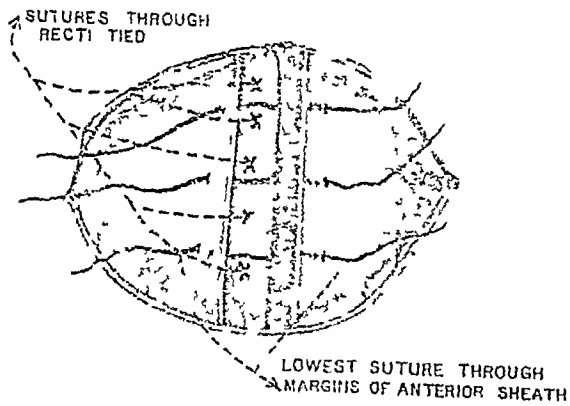


FIG X

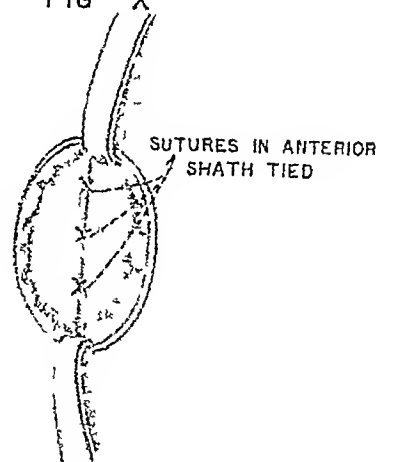
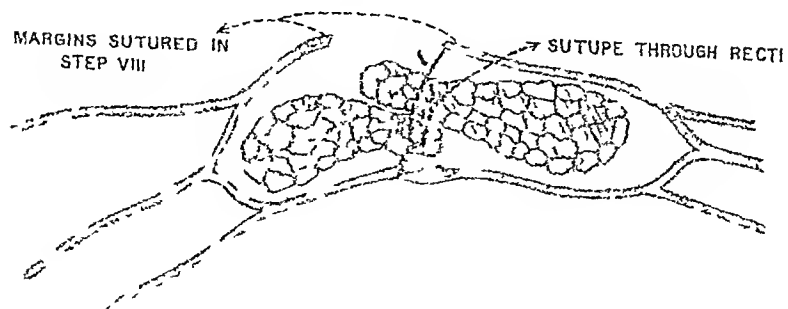


FIG IX A



Indian Medical Gazette.

NOVEMBER, 1908

SPRUE AND ALLIED DISORDERS

THE subject of sprue and other forms of chronic diarrhoea is one of the very greatest importance to the physician in the tropics, and we are far from as yet having reached any consensus of opinion as to the etiology or even differentiation of the various forms of flux, known as sprue, chronic diarrhoea, white flux, bill diarrhoea, etc

We welcome, therefore, the publication of an admirable and handsome volume on *Sprue and its Treatment** by Dr W Carnegie Brown, M D, of London

The book is handsomely got up, light to handle yet well printed on thick paper and in large type, and at a cost of only six shillings (6s)

We entirely agree with Dr Carnegie Brown in his use of the term sprue to denote this peculiar affection

In the first place, Dr Carnegie Brown shows that sprue must be differentiated from chronic diarrhoeas, such as bill diarrhoea, morning diarrhoea, famine diarrhoea, etc. The fact is that these complaints, though they have much in common with sprue, are essentially different, but when lack of nutrition and toxæmia have been marked features, the result is a uniform type of pathological change. The similarity of these anatomical changes according to Dr Carnegie Brown by no means implies that such diarrhoeas are variation forms of sprue. They cannot be accepted as having any definite relation to it. What then is sprue?

Sprue is a special disease of tropical origin manifested in a chronic catarrhal inflammation of the structures principally concerned in the functions of digestion and nutrition, *z.e.*, of the alimentary canal. It is characterised by definite lesions, which generally in consecutive and descending order affect the different portions of the alimentary tract, it is usually attended by two distinctive types of diarrhoea, an earlier and a later, by atrophic contraction of the liver, and in advanced stages by a characteristic form

of toxæmia. It is essentially insidious and chronic, and its progress is marked by remissions and exacerbations, occurring at considerable intervals. Its incidence is chiefly on Europeans of lengthened tropical residence.

It is a subject for discussion how far true sprue exists in India, other forms of tropical diarrhoeas are only too well known in India, and, as has been said above, the final pathological appearance and anatomical changes are very similar, but sprue in its entirety is certainly not so common or so prevalent in any part of India as it is in Dutch possessions further East and in parts of China. Sprue is a very common and seriously prevalent disease in the Straits Settlements, Federated Malay States and Siam, Cochin China, Annam, Java, Timor, Celebes, Macassar, Borneo, Sarawak, Labuan, Ceylon, The Treaty Ports of China, the Philippines and at Shanghai. The focus of the disease is to be found within a rough circle which has Singapore for its centre and embraces the Malay Peninsula, Annam, Siam, Java and Sumatra, and from which region it seems to have been conveyed as far as India to the North and West, to China on the East and North and to North Australia and the Fiji Islands on the South and East.

In this area the immunity of some places is well known, *e.g.*, Tonquin and Hongkong, Deli (Sumatra) and Acheen in spite of a large population of Europeans.

Sprue is pre-eminently a white man's disease, a disease of the white man in the tropics. The explanation of this pronounced race predilection is by no means easy.

We have not space to linger over Dr Carnegie Brown's excellent historical chapters in which he quotes from the writings of many well-known authors. Hillary of the Barbadoes in 1766 (where the disease is now not found) wrote an excellent description of the disease. Pingle in 1772 described chronic white flux. A century later D D Cunningham, M S, described famine diarrhoea (in 1877). Twining, Annesley, Alexander Grant, Morehead, and finally Sir Joseph Fayrer have all written on these tropical diarrhoeas, but Dr Carnegie Brown concludes that these physicians can only rarely, if ever, have seen genuine cases of sprue. Sir Joseph Fayrer's description of "chronic white tropical diarrhoea" in his Lettsomian Lectures for 1881 is certainly sprue, but the description appears to be based on the cases

* *Sprue and its Treatment*, by W Carnegie Brown, M D, M A C P, London, 1908. John Bale Sons and Danielson. Price, 6s.

seen by him as a London consultant rather than upon his Indian experiences. Of 13 cases 12 were seen by Fayrer in London and only one had come from India.

It was Sir P. Manson's paper in 1880 called modestly "Notes on Spue" that for the first time clearly differentiated and described the disease by the name Spue.

The rest of this excellent book is taken up with chapters on the symptoms and signs of spue, the morbid anatomy, pathology and diagnosis (an excellent chapter), then follows a chapter of great interest to all practitioners in India on bill diarrhoea and white flux, the treatment of bill diarrhoea is discussed in a later chapter.

Chapter VIII treats of the general principles of treatment of spue, the next is very full and discusses the dietetic treatment when fresh milk is available, another follows on treatment by a diet of milk and fruit. Chapter XIII discusses the treatment when fresh milk is unavailable or unsuitable and describes the treatment by meat only, etc. Another chapter deals with treatment by tinned milk, by peptones, casein preparations, and limited carbohydrate diets. Another discusses Vander Burg's treatment by fruit alone. The use of drugs is not neglected and two chapters are devoted to the subject. The chapter on the use of various fruits, strawberries, mangoes, plantains, etc., etc., is very useful. The danger of alcohol which must be absolutely forbidden, is emphasised. Other practical chapters are on the treatment of complications, on local medication, of mouth, nose, etc., etc., and a final chapter on the hygiene and prevention of spue—and the importance of a timely and seasonable return to Europe is emphasised, removal from the endemic area is imperative.

We strongly commend this useful and practical book to our readers. It should be in the library of every medical man in the tropics.

CHAUFFEUR'S FRACTURE

EVERYONE who uses a motor car is well aware of the very unsatisfactory method existing in most cars for starting the machinery by turning a handle usually in front. That the flying back of this handle can give a nasty jar to the wrist is known to all who use petrol cars.

The following explanation will interest motorists. We quote from an interesting article in the *Glasgow Medical Journal* (Sept 1908), by Sir G. T. Beatson, M.D., K.C.B., of the Western Infirmary, Glasgow—

"The method of starting in vogue is by means of a handle, about a foot long, which attached to the crank shaft of the engine, usually at the opposite end from the flywheel. When this handle is turned, the piston of the engine goes through all the four different strokes mentioned above, including the ignition of the compressed explosive mixture. This explosion takes place just as the third downward stroke has begun, with the result that after a couple or more complete revolutions of the handle the engine goes on working automatically, and the working handle is removed. It is the handle that is the active agent in causing the chauffeur's fracture, and it may do so under different conditions. In the first place, the fracture may happen at the removal of the handle, for if at this time the chauffeur is leaning too much weight on it, or is holding it with the thumb round it, he may not be able to disengage it, with the result that his hand will be carried round with the revolving handle and severely twisted backwards by the rotatory movement. Another time at which the fracture may occur is during the working of the handle. This is not an easy matter, especially in the upward strokes which compress the explosive mixture. The reason of this is that the pressure to be overcome at this time is often considerable, possibly 60 or 70 lbs. per square inch, and it is as much as the operator can do to accomplish it. Consequently there is a liability for the hand when it is at its upper limit of the stroke to swing back, and if the handle is being grasped with the thumb down, both handle and hand are carried round together, giving a severe backward wrench to the wrist.

Lastly, the flying back of the handle may be due to a third cause, viz, a "backfire," which means that the explosive mixture in the cylinder has been ignited too soon. As already mentioned, this ignition should take place just as the connecting rod of the piston has passed the dead centre of the crank, and when the piston has just started on the third or downward stroke. If, however, the explosion should occur prematurely before the crank has passed the dead centre of the engine, the result is that the piston is arrested in its cycle of strokes, and is driven violently backwards in an opposite direction carrying the crank and handle with it. Should the chauffeur at once get his hand disengaged from the handle, no harm is done, although the revolving handle may inflict a severe blow on the wrist or on any other part of the body, as in a case where a chauffeur was struck in the face and his nose seriously damaged, owing to his standing in a stooping position over the handle. If, however, it happens that the chauffeur is firmly grasping the handle, with his thumb underneath it and his knuckles upwards, he will be unable to get his hand away, with the result that it will be forced downwards with the handle, and bent backwards at the wrist with very considerable force.

Under any of these three conditions the chauffeur's fracture may occur, but the last is the usual cause of it, as it is accompanied by the most violence."

The seat of this fracture is usually the lower end of the radius. The line of it is transverse and fairly regular. The whole articular surface of the bone is carried off and sometimes stopping short of that it may pass into the joint. The broken off portion is triangular in shape and includes the styloid process of the radius. Practically speaking, the radius gives way at its weaker part just as it also does in cases of Colles's fracture.

The symptoms resemble a severe sprain of the wrist, swelling and pain and often crepitus. The X-rays will reveal the fracture.

The treatment is use of Carr's splints with early use of fingers. The splints should be worn for three weeks.

M Lucas Championnière apparently was the first to describe this fracture (*Bull d'Acad de Med*, 15th March 1904), and the late Mr F B Lund described some cases in the *Boston Medical and Surgical Journal* (for 31d November 1905).

We may also quote the following remarks from Sir George Beatson's interesting article —

"Let us now briefly consider the causation of this fracture at the wrist, which may happen to anyone in starting a petrol motor car. As we saw, it consists in the breaking off, close above its articular surface, of a triangular portion of the lower end of the radius, the portion broken off carrying with it the styloid process of that bone. Further, from what has been said, there are evidently three conditions under which it may occur. Although, as I pointed out, these latter may vary in the amount of violence accompanying them, there is one feature common to all three, and that is, *they twist backwards or over extend the hand, while it has a certain amount of outward rotation or ulnar deflexion*.

Now, it must be remembered that whether we regard the wrist joint as belonging to the ball and socket order (enarthrodial), or to the gliding variety (arthrodial) of joints, rotation is the only movement it does not admit of. In the accident I have described this evening a certain amount of rotation occurs while the hand is over-extended. In addition to this, it must be borne in mind that at the moment the over extension of the hand occurs, all the muscles of the fore arm are rigid and fixed in the strong effort that is being made. The view, then, that I take of this chauffeur's fracture is that it is caused by indirect violence, and is the result of sudden over extension of the hand while the latter has some ulnar deflexion, this latter factor being the element that determines the triangular shape of the portion of bone broken off.

In connection with a fracture so situated, and so caused, one naturally asks, what relation does it bear to the fracture which we instinctively associate with all injuries at the wrist, viz, Colles's? My own feeling is that it is closely allied to it, and furnishes evidence that is of interest and that has a very distinct bearing

on some of the disputed points in the pathology of that fracture.

The lesson taught by the chauffeur's fracture, which is really a Colles's fracture, is, I think, the important one that there may be a Colles's fracture without the typical deformity. This fact is not sufficiently recognised, and many so called sprains of the wrist are reckoned to be such because there is no deformity. This was what happened in one case of mine. It was caused by a fall on the palm of the hand when high jumping, and was pronounced by a medical man to be a sprain. The X ray photograph showed the presence of a fracture, which in every way represents the triangular bit broken off in the chauffeur's fracture. This is what might be expected, for in both, hyper-extension of the wrist is the exciting factor.

Just a word as to the prevention of chauffeur's fracture. It can be largely avoided by having a proper hold of the handle. This should be grasped with the knuckles down and the thumb placed over. In this position the handle is easily released if a back fire should occur. In addition, there are arrangements in the machinery, I understand, by which the ignition of the explosive mixture may be retarded at the time of starting, and all experienced motorists attend to these points."

Current Topics.

THE INDIAN MILITARY FAMILY PENSION FUND

THE *Gazette of India*, dated 26th September 1908 (Notification 2233P, dated 25th September 1908) publishes for the information of all concerned the revised rules of the Indian Military Family Pension Fund.

Our readers will remember that from 1st September 1907, a reduction of 25 per cent on the subscriptions and donations was made, and these reductions, called in the revised edition of the rules "temporary," still remain in force.

We have compared the revised rules with those issued to all officers concerned in pamphlet form in September 1907, and we find that though there are many minor changes, there are none of any real importance to the members of the Indian Medical Service.

We recommend that all officers concerned should read these regulations, as ignorance of the rules gives no claim to exemption from penalties for non-payment or from delay in payment. Every subscriber must protect his own interests and see that his subscriptions and donations are regularly deducted when due.

We may call attention to a few points in these regulations about which we know some ignorance exists.

1 Native members of the Indian Medical Service are given the option of subscribing.

2 Under certain conditions an I M S officer who has completed 25 years' full pay service

and has subscribed previously in class II may, if he likes, subscribe in class I and so secure the higher pension to his widow. That is, instead of subscribing as a married man £2 17s 6d a month, he can subscribe £3 12s a month and by so doing (and we presume after his paying the donation on entering class I, viz., £54) his widow will be entitled to the highest rate of pension, viz., £160 (instead of £130 of class II).

3. A new Table (Table III A) is introduced—"Excess age donations"—by which an officer for each year of age exceeding an age laid down must give an extra donation on entering a class. An example will make this clearer. A Captain, on becoming a Major, enters class III, and if married now pays a donation of £18. If over the age of 42 on becoming Major, and entering class III, he must in addition pay an excess age donation of £6 for each year exceeding 42. Practically speaking, this does not apply to I M S officers as they get promotion to Major before the age of 42.

4. The following table shows the rates now in force. The temporarily reduced rates now payable are only shown—

Monthly Contribution by every Officer according to his Class

Class of Contributor	BY EACH MARRIED OFFICER		BY EACH OFFICER WHO IS UNMARRIED OR A WIDOWER	
	Full Rates	Half Rates	Full Rates	Half Rates
	£ s d	£ s d	£ s d	£ s d
Class I Officers in receipt of Colonel's allowances	3 12 0	1 16 0	1 16 0	0 18 0
Class II Lt Col	2 17 6	1 8 9	1 3 0	0 11 6
Class III Majors, I M S	2 3 2	1 1 7	0 17 4	0 8 9
Class IV Captains over 6 yrs	1 8 10	0 14 5	0 10 0	0 5 0
Class V Captains under 6 yrs and Lieuts, I M S	0 14 6	0 7 3	0 5 10	0 2 11

5. It should not be forgotten that the above "half rates" only are payable during leave, excepting privilege leave in or out of India.

6. Halfpay officers must continue to subscribe for full benefits, but during half pay they have the option of only paying half for their wives, but arrears will have to be paid up on retirement or on reversion to full pay.

7. It is not always remembered that married officers must continue to subscribe on retirement at half rates, or they may withdraw and receive a portion of their subscriptions back. Practically speaking, retired married officers must continue to subscribe.

8. We again direct attention to the useful special contribution for passage money. The amount secured must not exceed Rs 3,000, but the terms are good and in the event of the officer's death in India the amount so secured is paid at once to the widow, or if the widow is not in India, the amount is credited to the estate of the deceased officer. If the subscriber likes on or after leaving India, he may take the surrender value of this insurance.

9. An officer, nearest age 30 may, on payment of a single premium of 393 rupees (or by instalments extending up to four years subject to 3½ per cent interest) secure an insurance of Rs 1,000, at age 35 by payment of 426, at age 40, Rs 463, at age 45, Rs 507, and so on even to the age of 60 years on payment of 661 rupees.

10. The surrender value of such assurance of Rs 1,000 is as follows: at 45 on retiring 494, on retiring at 25 years' service, say at age of 50, the surrender value would be 541.

We commend the revised regulations to the attention of all I M S officers. The pensions are by no means great, but they are something, and unless a man has saved money, or insured his life or has private means, this and the children's pension are all that his widow has to look forward to.

We have never believed that officers of the Indian Army get the best insurance value for these compulsory subscriptions, but we all must subscribe to them whether we like it or not, and we strongly recommend all medical officers, whether married or unmarried, to go in for the other form of compulsory saving by life assurance in any of the good offices, and for advice on such points we cannot do better than refer to the pamphlets issued by Mr P Henderson, I C S (retired), who has made a special study of the subject as it affects especially service men in India.

THE BOMBAY LABORATORY REPORT, 1907

THE post of Director was held by Lieutenant-Colonel W B Baneriman, M D, BSc, FRSE, IMS, from 1st January 1907 to 30th August 1907, when he went on leave, and Capt W Glen Liston, M D, DPH, IMS, was appointed to hold charge of the current duties of the Director in addition to his duties as Senior Member of Plague Research Commission.

The assistants to the Director were—Dr F M Gibson, MB, BSc (Edin), who returned from furlough on 11th November, Captain F P Mackie, MB, FRCS, IMS, who was on leave from March 30th to June 28th, his place being taken by Captain T H Gloster, MB, IMS, Captain D Steel, MB, (Glasgow), IMS, acted for Dr Gibson from 1st January to 9th September, on which date he was granted sick leave. Captain Gloster acted for Captain Steel from 30th September till 25th November, on the return of Dr Gibson from leave.

The following table shows the slow but sure progress in the use of the *anti-plague vaccine* —

1904	115,161 issues
1905	315,905 "
1906	176,651 "
1907	620,923 "

The Punjab and United Provinces took almost half of this issue

The report of Captain Goodbody on the relative value of plague measures quoted in this report is one which should have been published separately. In addition to Captain Goodbody's report much other evidence is here given as to the great value of inoculation. We may quote the following remarks of Captain Glen Liston, I.M.S., the officiating Director of the Laboratory —

A number of different *prophylactic vaccines* have been prepared and tested on men and animals. We may here mention (1) Haffkine's prophylactic, (2) the German Commission's vaccine, (3) Lustig's and Galeotti's vaccine, (4) Terni and Bandi's vaccine, (5) Shiga's vaccine, (6) Bressedha's vaccine, (7) Gosio's vaccine, (8) Hueppe and Kikuche's vaccine, (9) Klein's vaccine, (10) Kolle's and Strong's vaccine.

The majority of these vaccines, unlike the vaccine prepared at this Laboratory, labour under one or other of the following disadvantages: (1) They require considerable bacteriological skill in their preparation, and (2) can therefore only be made on a large scale by employing a large staff of expert bacteriologists, (3) some of the vaccines, such as, for example, Klein's and Terni and Bandi's vaccine, involve the use of animal tissues in their preparation, and in this respect are unsuited for use among a Hindu community.

Of the vaccines enumerated above, the best results in animals have been obtained when Kolle and Strong's vaccine has been used. Their vaccine is a living culture of an attenuated or a virulent plague bacillus. Strong claims, that he has entirely failed to reclaim the lost virulence of his cultures. Inoculation with this living attenuated vaccine gives rise to symptoms not unlike those produced by the injection of Haffkine's vaccine.

It cannot be said that inoculation, as at present practised, is free from disagreeable symptoms. The febrile reaction, pain and malaise which follow inoculation are perhaps the greatest deterrents to the exploitation of this method of combating the pest. To what extent these unpleasant symptoms are a necessary part of a successful vaccination is not yet known. No method has yet been devised for measuring in man the degree of immunity acquired against plague by inoculation with a vaccine.

Sir A. E. Wright has, however, recently introduced his method of measuring the opsonic content of the serum of persons suffering from bacterial infections or immunised against bacterial diseases by specific vaccines. A considerable amount of work has been accomplished in this connection in the Laboratory, sufficient to show that, as in the majority of other bacterial diseases, the opsonic index of persons inoculated against plague is considerably raised, but the accuracy of the method in all cases has not yet been assured. Many technical difficulties in making this estimation have yet to be overcome in order to ensure reliable results. Every effort is at present being made to get over these difficulties, for it is hoped that, by the development of this method of estimating the opsonic index of the blood of inoculated persons, an advance will be made which may lead to the discovery of a vaccine, which can be easily administered and which will produce its immunising effects without the development of the disagreeable

symptoms at present associated with the hypodermic injection of the majority of efficient anti-plague vaccines.

Captain Glen Liston also gives a very valuable review of the subject of *DISINFECTANTS* and their action against plague bacilli and rats and fleas. We may quote as follows —

In the following table the results of testing a number of substances as to their bactericidal and pulicidal powers is recorded. The bactericidal power of the substance on the plague bacillus has been compared with the action of carbolic acid on the same bacillus. The pulicidal (flea killing) power of each substance has been compared with the pulicidal power of kerosine oil emulsion on the rat flea (*Xenopsylla cheopis*). Each plus sign indicates a greater degree of bactericidal or pulicidal power as compared with the abovementioned standards, while each minus sign indicates a lesser degree of the same powers compared with the same standards. A + sign indicates a degree of efficiency equal to the standards —

Substance	Compared with carbolic acid as bactericide	Compared with kerosine oil emulsion as pulicide
Acid Perchloride of Mercury	+ + +	- - -
Hydrocarbon emulsion	+	+
McDougall's Sanitary Fluid	+	- -
Do Karbo	+	- -
Do Disinfecting Fluid	+	- -
Do Cide Oil Emulsion	+ +	- -
Ozu	- - -	- - -
Lysol	Not tested	- - -
Cyllin	+	- - -
Kerocyll	+ + +	- - -
Plumas	Not tested	-
Antipest	- - -	+
Izo Izal	Not tested	-
Vivilin	+ +	- -
Carbolic Acid	+	- -

The following remarks by Capt Glen Liston, will be read with interest —

The *RAT POPULATION* of Indian towns and villages is very great, many houses are badly infested. The most important species is *M. rattus*, this rat has no definite breeding season, each female *rattus* gives birth to about five young in a litter and has four or five litters in each year. Out of 338,870 rats examined in Bombay no less than 46,428 have been found infected by plague. No disease is so fatal to rats as is plague, but despite ten or eleven years' plague, the rats in Bombay are nearly as numerous as ever.

Ratin No 2, like the Danyez virus, is practically useless and the following warning is worth noting —

A word of warning must here be given. Although the majority of bacterial rat poisons are sold to the public as harmless preparations, the greatest care is necessary in handling and using them. The organism from which these so-called disease producing poisons are generally prepared is closely related to, if not identical with, the bacillus of paratyphoid fever. Certain cases of this disease are said to have been traced to the handling of a bacterial virus for killing rats.

The following extracts are also of interest —

OILING THE BODY as a Preventive against Plague

It has been stated that persons who oil their bodies are protected from the plague, and it has been suggested that this practice might be adopted as a plague preventive measure. A number of experiments have been carried out which show that the body of a person who has been anointed with oil is not as a matter of fact absolutely protected from the bites of fleas. The method of experiment was to collect in a godown a large number of rat fleas which were starved for twenty-four hours in order to compel them to feed upon man. A man who had one leg anointed with oil, while the other leg was left unoiled, then entered the godown. The fleas jumped upon his legs, and the number attacking the oiled and unoled legs was not different. Three kinds of oils were tested with the following results —

Cocoonut oil—Six experiments were made. In all thirty fleas came upon the oiled leg, while fifty-two were counted on the unoled leg.

Sesamum oil—Three experiments gave in all nine fleas on the oiled leg and thirteen on the unoled leg.

Mustard oil—In six experiments thirty-one fleas were caught on the oiled leg and an exactly similar number on the unoled leg.

The effect of EXPOSING CLOTHING OR RAGS to Sunlight for the purpose of freeing them from Fleas

There is no doubt that plague can be carried from an infected locality to a healthy place by means of so-called "soiled clothing and rags." The Plague Commission have shown that the transport of the disease in this way must be effected by means of fleas carried in clothing or rags.

It has been suggested that, since the rat flea dislikes the light, soiled clothing might be freed from fleas by exposing it in a thin layer to the action of the sun. A number of experiments have been undertaken to test the value of this suggestion. The experiments were made in the following way —

A small bundle of rags was collected sufficient to cover about two square yards when spread out in a thin layer. These rags were placed in a box and sixty rat fleas scattered through the rags. The box was closed for half an hour to accustom the fleas to their new environment. It was then opened and the rags were spread out in a thin layer on a large piece of glass covered land on which the sun shone throughout the period of the experiment. In various experiments the rags were exposed in this way for from one to three hours. After exposure the rags were collected together and placed in a flea proof godown which was shown to be free from rat fleas. Two flea free guinea pigs were then allowed to run among the rags for twelve or more hours to trap any fleas that might still remain upon the rags. The various experiments showed that while an exposure of one or two hours failed to remove all fleas from the rags, an exposure of three hours freed the rags from fleas, so that these insects could not be captured on the guinea pigs which were allowed to run over the rags exposed to the sun for this period.

It should be noted that exposure to the sun does not kill the fleas but causes them to leave the material thus exposed. If the fleas leave the soiled clothing in an open piece of ground away from human habitations they are not likely to find their way to louse rats before they are starved to death. Where other means, such as steam disinfection, are not available, this method of freeing contaminated clothing from fleas might with advantage be adopted.

Capt Mackie's researches into the etiology of RELAPSING FEVER are here summarised as follows —

An epidemic of relapsing fever broke out in a mixed settlement of boys and girls living under similar conditions. A very high percentage of the boys fell

victims to the disease in the course of a few weeks. A much smaller percentage of girls fell ill and at frequent intervals extending over three months. The most notable factor in which the boys differed from the girls was that they were infested with body lice from which parasites the girls were almost free. With the increase of the epidemic among the girls, body lice among them became more in evidence. With the subsidence of the epidemic among the boys, the number of lice fell. A well marked percentage of the lice taken from the infected wards contained living and multiplying spirilla, the germs of the disease. In the louse, the stomach was the chief seat of multiplication of the germs and the multiplication occurred in spite of the active digestion and absorption of the cellular elements of the blood which had been ingested along with the parasite in the blood of an infected patient. The secretion expressed from the mouth of infected lice contained numbers of living spirilla.

It should be noted that apart from the multiplication of the relapsing fever organism which is found in the blood of a person sick with the disease, every attempt at cultivating the germ outside the body of man has failed. The discovery that the germ multiplies in the body of the louse is therefore of great interest and importance.

The above facts are sufficient to throw grave suspicion on the body louse as a transmitter of relapsing fever. Many epidemiological facts are in favour of the view that the body louse is the agent by means of which the germ of relapsing fever is transmitted from the sick to the healthy. The disease has always been associated with poverty stricken, overcrowded and half starved communities. It is among such communities that body lice are most frequently found. In Bombay, for example, the disease attacks poor, dirty and low caste persons living in squalid tenements and is seldom met with among those of cleanly habits who live among better conditions of life.

Relapsing fever, unlike plague, is a "personal" rather than a "place" disease and among stricken communities the infection spreads very rapidly from person to person. Mere contiguity without contact with an infected person is not sufficient to bring about infection. These epidemiological facts have a reasonable explanation in the habits of the body louse. This insect is essentially a human parasite and it passes readily from the clothing of an infested person to the clothing of another who has come in contact with the infested individual. It is easy to demonstrate this by gently passing a piece of clean blanket over clothing infested with lice; it will be found that the insects very readily adhere to the clean surface.

It is probable that the germs of the disease are injected into the human being through the proboscis of the louse when it sucks the blood of its host, for the secretion expressed from the mouth of an infected louse contains vast numbers of the infecting organism.

It is interesting to note that Captain Mackie has recently received a letter from Dr. Ed Seigent of the Pasteur Institute of Paris, in which he states that working independently on the same lines he has since come to the same conclusion as Captain Mackie.

ANIMAL PARASITES IN MAN

In numerous papers in previous volumes of the *Indian Medical Gazette*, it has been clearly shown by Calvert, Maddox, Grainger, Lane and Feanside, and previously by Giles and Dobson, all of the Indian Medical Service, that a very high percentage of the inhabitants of most parts of India harbour some form or forms of intestinal animal parasites. This percentage varies, but is always from 75 to 90 per cent of

the persons examined. It is far from a settled question whether the mere presence of these parasites, even in considerable number, has much effect on the general health of the host, and it will be remembered that at a time when ankylostomiasis was being widely recognised and considered by some to be a cause or at least a strong contributing cause in the cachexia then and still known as *Kala azar*, Lt-Colonel Edwin Dobson, R.M.S., then Civil Surgeon of Dhubri, was able to point out that a very high percentage of coolies, who passed Dhubri and were there examined before being sent on to the Assam tea gardens, were in excellent physical health in spite of the fact that the great majority of them harboured many animal parasites and specially many ankylostomata.

The question has since been discussed in many quarters from the Cornwall mines to Porto Rico, from Assam to the Philippines, and there has been a tendency in all these countries to attribute a considerable degree of illness to various animal parasites.

In the July Number of *The Philippine Journal of Science* (Vol III, No 3), Dr P E Garrison has an interesting paper on the prevalence and distribution of the animal parasites of man in the Philippines.

The following table summarises his results —

EXAMINATION AND INFECTIONS	NUMBER	PER CENT
Prisoners examined	4,106	
„ infected	3,447	84
Whipworms (<i>trichuris</i>)	2,426	59
Hookworms	2,135	52
Belworms (<i>ascaris</i>)	1,052	26
Amoeba	926	23
Protozoa (ciliates and flagellates)	553	21
Stranguloids	132	3
Penworms (<i>oxyuris</i>)	32	0.8
Tænia	30	0.7
Japan lung flukes (<i>para gonimus</i>)	18	0.4
Blood flukes (<i>schistosoma</i>)	16	0.4
Liver flukes (<i>opisthorcis</i>)	11	0.3
Dwarf tapeworm	5	0.1
Total infections	7,636	186
Intestinal worms only	5,812	142
Flukes	45	1.1
All intestinal protozoa	1,779	43

What, however, is the evidence that such parasitic or verminous infections of the intestine are directly or in any very serious degree injurious? That they are probably so may be believed, but to get any accurate measure of the injury done, is practically next to impossible.

The results of prophylactic measures carried out at the prison at Bilibid are quoted by Dr Garrison.

It appears that some years ago the death-rate in this prison was no less than 238 per mille, general sanitation reduced this figure to 75 per mille, and at this point it remained stationary. Then, attention was paid to the great prevalence

of intestinal worm infections and measures against them instituted, and in Dr Hersey's opinion this "anthelmintic campaign" was the cause of the death-rate dropping to the very respectable figure of 13 per mille. This was apparent only in the end of 1906, and it is a big presumption to say that this sudden and enormous fall in the death-rate was due to any one measure, however valuable, and it is equally hazardous to say that this low rate will remain. In fact, it may fairly be said that it is quite impossible for it to remain. The question still remains, therefore—to what extent is infection with animal parasites a cause of serious ill-health?

In our own experience we are inclined to think that recent observers are making the same mistake as was made by some in India and Ceylon 12 to 15 years ago, and that these observers, because they find a high percentage prevalence of these nasty parasites, are rushing to the conclusion that they must also be highly injurious. This is by no means certain.

SURRA IN THE MALAY STATES

THE ninth publication of the Institute for Medical Research in the Federated Malay States is an admirable study on Surra, by Dr Henry Fraser, the Director, and Mr L Symonds, the Government Veterinary Surgeon, to which is added a note on the distribution of certain biting flies in these States, by Mr H C Pratt, the Government Entomologist.

The following conclusions have been arrived at —

The trypanosomes which have been the subject of this investigation belong to the species *Trypanosoma Evansi*.

The trypanosomes which have been met with in horses, cattle, and dogs are indistinguishable morphologically and in their pathological effects.

Considerable variations have been noted in the virulence of the several strains of trypanosomes dealt with.

The clinical diagnosis of the disease in horses is comparatively easy.

The disease in cattle is to be suspected when there is marked emaciation which cannot otherwise be accounted for, as so great difficulty is frequently encountered in the detection microscopically of trypanosomes in cattle inoculation of their blood into laboratory animals will, as a rule, be required.

Mechanical transmission of the disease has been effected by four species of flies of the genus *Tabanus*, but not by flies of the genus *Stomoxys*.

Surra has only been met with in horses whose stables were in the vicinity of jungle, and consequently where flies of the species *Tabanus fumifer* abound.

In cattle the history usually points to the infection having been acquired in the outlying districts.

In towns there are a certain proportion of infected animals and numbers of susceptible ones, but flies of the genus *Tabanus* are not common.

Experimentally it has been found that the incubation period is intimately connected with the number of parasites inoculated and the rate of proliferation of the trypanosomes in the animal, *ceteris paribus*, the fewer the trypanosomes inoculated the longer will be the interval before their presence is discovered in the peripheral blood and *vice versa*.

Experiments conducted with a view to determine whether or not part of the life cycle of the trypanosomes was carried out in biting flies, were inconclusive, but so far as they have gone, it has been shown that trypanosomes as such are not to be found in the gastro intestinal contents of infected flies after 24 hours.

Treatment by means of Atoxyl, Mercuric Chloride, and Tartarated antimony was not encouraging. The parasites could be caused to disappear from the peripheral circulation and the health of the animals much improved, but these results were only temporary.

Surra is endemic in the Federated Malay States, in addition, animals harbouring the parasites may be and have been imported from India, Siam, and the Siamese States, as well as Java and Sumatra.

No practical measures are available whereby the entry of apparently healthy cattle harbouring the parasites might be prevented.

In the present state of our knowledge it is scarcely possible to hope for eradication of the disease, it can, however, be kept in check by the destruction of all animals found to be affected.

Emaciated cattle, whose condition cannot be accounted for, should be destroyed.

The herding of cattle in large numbers, especially near jungle, is to be avoided.

The detention of horses and cattle at the port or place of entry into these States, until such time as they have been examined, is advisable.

Quarantine, as usually understood, is unlikely to be of assistance in the detection of the disease.

WE have received a copy of the third issue of a New Medical Journal for use of Hospital Assistants, entitled *The Agra Medical Club Journal*, edited by Jawahar Lal and R. D. Pandya.

We are glad to see a Journal of this kind started in India, but would point out the danger of having too many.

One really good, well-edited Journal is worth a dozen others, e.g., the now fairly numerous Journals of this sort in India joined together to make one first class paper would be good for all.

We are glad, however, to see that the students of the Agra School are so keen on their work as to start a Medical Club and a Medical Journal, and we wish it all success.

MEDICAL men intending to join the Bombay Medical Congress should at once send their subscriptions to the Secretary, Lt-Col W. E. Jennings, I.M.S., c/o Messrs King King, & Co, Bombay.

Reviews.

The Extra Pharmacopœia—By MARTINDALE AND WESTCOTT. Pp. xl + 1164. Med. 24mo. Price, 10s 6d net. Thirteenth Edition. London: H. K. Lewis & Co., August 1908.

To praise this book is entirely superfluous, every medical man knows it and few go anywhere without it.

The 13th edition is smaller than the 12th, though it contains 128 more pages. This has been

managed by use of smaller type in places and by use of a thinner paper. The little volume in its 13th edition is, therefore, less bulky and more adapted to the pocket than its predecessor was. It takes 19 pages of preface to describe all the additions, alterations and improvements in the new edition, so we must be spared their enumeration. This is at least sufficient to show that the practitioner would do well to purchase even another edition of this *vade mecum*.

If we were to offer any criticism, we would say that the volume contains too much, a chapter on the various mineral waters is essential and on various antiseptic powders useful, but we doubt if the physician on his rounds needs analytical memoranda, or the notes on water analysis, or on the preparation of culture media. He can get all these in many books on his library shelves, and their omission would leave more room for therapeutics and for the provision of a more opaque paper.

It is a wonderful little book and every edition becomes more wonderful.

Hindustani Self-Taught—By CAPTAIN C. A. THIMM. London: E. Marlborough & Co. Marlborough's Self-Taught Series, No. 15. Third Edition. Paper cover, Re 18, cloth, Re 1-14.

THIS is the third edition of one of the best known of the "Self-Taught Series." This is one of the best little books for learning Hindustani we know. It has a very large vocabulary dealing with colloquial phrases, conversations, military, legal, medical and commercial terms, shooting and fishing terms, money, measures, weights, Indian names, castes and servants.

There is only one criticism we would wish to offer and that is, that in a book not intended for students working to pass an examination, but for travellers, soldiers, traders and officials, it would be better to give the sentences as Hindustani is spoken in every-day life to servants, etc., and not in the strict grammatical way—for example, who in ordinary parlance says?—*Marn ne kuch nahin suna, or marn kul jaunga*.

The personal pronoun is not used in the singular, then why teach it? This custom of using the plural for "you" and "I" in Hindustani is universal, and if European travellers are to be taught enough Hindustani to be useful, why then, let it be Hindustani "as she is spoke."

Physical Signs of Diseases of the Thorax and Abdomen—By JAMES E. H. SAWYER, M.A., M.D. Oxon., M.R.C.P. Pages 188. Illustrations 32. Crown 8vo. Price, 5s net. Baillière, Tindall and Cox, 8, Henrietta Street, London.

THIS little book should be of use to students beginning their clinical studies, the methods of examinations usually employed are carefully described and should be readily understood. There is little to say about the book, perhaps in places too much is written on one subject and this may tend to confuse the student at times.

early stage of his career. The reading of this book should supplement and not supplant practical demonstrations of the methods of examination.

The Sexual Disabilities of Man.—By ARTHUR COOPER. London, 1908. H. R. Lewis & Co. Pp 184. 12mo. Price 4s net.

This is a little book which can be strongly recommended. It deals with a subject not always understood as well as it should be by many medical men, and it is one which receives but scanty recognition in any of the medical schools.

After an introduction the book is divided into two portions, *viz*, five chapters on sterility and six chapters on impotence. The book is written clearly and in a healthy tone.

We commend the little book to the notice of our readers, it will probably help them much when consulted about these difficult classes of cases. The subject of treatment is well dealt with.

Landmarks and Surface Markings of the Human Body.—By LOUIS D. RAWLINGS, F.R.C.S. 31 Illustrations. Pp viii+96. Demy 8vo. Price 5s. 29 Plates. London, 1908. H. K. Lewis.

THIS is the third edition of a most useful book. The first two editions have met with marked success, the second edition was an amplification of the first, but this edition chiefly differs from the second by the insertion of new illustrations.

To the surgeon and physician the book is invaluable, many men forget much of the detailed anatomy of the body, but all must needs remember the surface markings and landmarks, which are of practical importance in every-day life and practice.

The illustrations which are a notable feature of this volume are very well done and a credit to the publishers.

Epitome of Urine Examination.—By K. S. AGNIHOTRI, Ph.C., Hospital Assistant, Kolhapur. Mission Press, 1908. Price 10 annas.

SOME time ago we noticed a useful little book entitled 'The General Dispenser' from the pen of Dr Agnihotri. The same writer now sends us an excellent epitome of urine examination, which we believe will be very useful. It is cheap and within the reach of all hospital assistants and medical students, to whose notice we commend it.

Medical Society.

MEDICAL SOCIETY ASIATIC SOCIETY OF BENGAL

THE following are notes of cases exhibited and discussed at recent meetings of the Medical Section of the Asiatic Society of Bengal.

CASES SHOWN BY LT-COLONEL G. A. F. HARRIS, M.D., F.R.C.P.

Siddheswar G., aged 39, a compositor by occupation, was admitted for the treatment of breathlessness, pain in the upper part of the chest and dilated veins on the anterior abdominal wall. He had syphilis and gonorrhoea eight or ten years ago. There is no hereditary tendency. About a year ago he first noticed swelling of the face, about six months ago he noticed that his hands were also swollen. These swellings used to come and go at times. Gradually he became very weak and was confined to bed. He gives history of general anasarca at this time which subsided after a course of treatment.

The superficial abdominal veins are dilated and tortuous. Some of the intercostal veins are also dilated and full. The circulation in these veins is from above downwards. The enlarged abdominal veins are seen to be continuous with the internal mammary vein. No glands except those at the groin are enlarged.

He complains of pain on the upper part of the right side of the chest. There is not much cough, but he complains of dyspnoea on slight exertion. There is impairment of movement on the left side of the chest, but no bulging. On percussion the left side is stony dull both in front and back. The cardiac area of dullness is merged in the general dullness. Vocal fremitus is also much diminished on that side. On auscultation there is tubular breathing all over the left lung. Friction and crepitation can be heard over the upper part of the right lung.

Examined under X-rays the whole of the left lung appeared as a dark shadow, but on the right side there was only a triangular dark shadow at its upper part.

On laryngoscopic examination no ulceration can be found in the larynx. The left vocal cord is paralysed. The right vocal cord is moving all right and comes over the left vocal cord. The voice is husky.

There is only a trace of albumen in the urine. There are no casts. Temperature is normal. T. bacilli have been found in the sputum.

Monmotho N., an inhabitant of Calcutta, 35 years of age, a blacksmith by occupation, came to the Medical College Hospital for the treatment of cedema of right foot, of the face and pain on these parts.

The patient gives a history of syphilis ten years back. On the 9th of April last, he noticed swelling of the gum behind the last right molar tooth. It was lanced. On the following day, he noticed that his face had swollen up and was painful. Four days after he accidentally burnt the tip of the third right toe, and within 12 hours from this he noticed that his foot is getting cedematous. Within the next 12 hours this cedema had extended up to the ankle and the right calf was tender. This cedema has gone down to a considerable extent now, but

there is a patch of anæsthesia on the dorsum of the foot

Now, the left side of the face is markedly cedematous and painful. There are two reddish patches over the glabella and beneath the left lower eyelid. These patches are also anæsthetic. The nose is also much swollen. A thickened cord-like structure crosses the sterno-mastoid muscle from below upon the left side.

The knee-jerks are exaggerated. There is ankle-drop of the right foot. On the right side he has got high-steppage gait, but on the left side it is normal. A cord-like structure can be felt at the back of the right leg, especially at the lower part.

On the 20th of June, he had an attack of conjunctivitis. This lasted only for a week. The constant pain in the lower limb is getting less and less. The high-steppage gait is also less marked now.

On the 8th of July, a portion of the cord-like structure was excised, this on examination proved to be a nerve, on microscopical examination no lepra bacilli can be found, but there was small-celled infiltration among the nerve-fibrils.

W. M., 39, a mechanical engineer in a coal mine, a resident of Guidih, complains of swelling of the forearm and foot for the last two months.

He has to work very hard from morning till evening and uses his right hand much. He gives history of alcohol. He had syphilis three years back. He had also several attacks of gonorrhœa.

He had an attack of malarial fever two months ago, a month after, while still suffering from the fever, he got pain in his right wrist, forearm, right ankle and knee and along the whole length of the spinal column. Gradually the affected arm and leg began to swell, but it is confined only to the right forearm, leg and foot. The swelling of the leg has gone down since, but the ankle is still swollen. The pain in the back is still present. The swelling of the forearm is strictly limited to the portion between the elbow and wrist. The hand is quite normal.

He complains of pain when the bone is pressed upon, but pressure on the muscles do not cause any pain. He can walk easily, but has difficulty in lifting up things with the right hand.

There is nothing abnormal in the circulatory system. There is no enlargement of the liver or spleen. There is no albumen in the urine.

R. M., a station master by occupation, complains of gradual enlargement of the thyroid gland with emaciation and palpitation. He is a resident of Mokameh. About a year ago he noticed first tremors of the hand. Two months afterwards he noticed slight enlargement of the thyroid gland. At this time he was transferred to Tundla near Agra. At the Agra Hospital he was admitted for the treatment of goitre, where he was advised operation. This worried him much.

The tremor has now become general, but it is specially marked on the tongue and hand. The enlargement of the thyroid is gradually increasing. The right lobe is greater than the left. A systolic murmur can be heard over it.

He is getting weaker day by day. He has a staring look and a distressed appearance. He gets palpitation occasionally. Heart beat is forcible, and heaving about 100 per minute. The visible area of cardiac pulsation is much increased. The carotids can be seen throbbing forcibly. Occasionally he gets profuse perspiration.

He complains of weakness of both the legs. Speech is indistinct owing to the tremor of the tongue.

The eye symptoms are not much marked. There is widening of the palpebral aperture. Von Græfe's sign (want of co-ordination of the movements of the eyeball and the upper eyelid) is not present. The vision is normal. The protrusion of the eyeball is only slight. There is no pigmentary change.

MAJOR O'KINEALY'S CASES

I ANCHYLOBLEPHARON

Male child, aged six months, fairly developed. Father's name, Ramdhan, aged about 35, mother's age about 25.

Child's father is a cobbler by occupation. He had another boy who died about ten months ago at the age of three. Cannot say what disease the child died of. He was a fairly healthy child. There is no history of any deformity or monster in his family, both maternal and paternal.

The husband is not in any other way related to his wife.

There is no history of any accident during pregnancy. Labour—normal. Father and mother are both healthy. Gives no history of any specific diseases. There is no evidence of any other congenital defect in the child.

Both eyes are closed. There is no palpebral fissure. There is no evidence of eyelids. The right eyeball is a projection and the projection is more to the right. The projecting mass is soft to touch. The eyeball moves in all direction under the skin.

The left eye—Bony socket can be felt, and in it a soft mass can be felt.

II PARINAUD'S CONJUNCTIVITIS

First described in 1889.

Usually uni-ocular—Granulations or vegetations on tarsal conjunctiva or fornices (one lid not infrequently more affected than other, however usually most affected). Considerable enlargement of preauricular and neighbouring glands on affected side. Onset usually with chills and malaise. Slight mucous or fibrinous discharge, no suppuration. Complete cure in time (some months sometimes) without corneal complications or subsequent scarring. Glands

glands suppurate The submaxillary or even glands cervical may be affected Upper lids swollen and droop Subjective symptoms slight Ptosis and glands usually last to clear up

Cause unknown, not infectious Streptococcal infection Distinguish from trachoma and tubercle

Treatment—Simple antiseptics, Ag No_a excision galvanocautery, incision of glands when suppurating

CASE

Patient's name, B Ch S, aged 20, occupation, compounder About a month and a half ago he noticed that his palpebral conjunctiva of the left eye is infected and swollen The swelling gradually increased and he noticed as if there is some foreign body inside his lids His sight is little impaired The glands of the neck of the left side are enlarged They were enlarged at about the same time as the affection of the eye He has got slight difficulty in swallowing

The right eye is normal Gives no history of any specific diseases Never had any affection of the eyes before

Pathological Examination—Negative

CASE OF MYOCLONIA, SHOWN BY LT-COLONEL F J DRURY, I M S

The patient, a Hindu male, aged 45—50, complains of his symptoms for about one year, these are clonic contractions of the sterno-mastoids, giving a nodding action to the head He stated that the movements came on after some violent mental emotion—a family quarrel in which he was worsted and he suffered great mental anxiety as a consequence

It was noticed that the movements were almost confined to the sterno-mastoids, and while absent when he was at rest, they were brought on by any movements such as walking about, swallowing or speaking The contractions were at the rate of three or four to the second The muscles of the thighs and back were stiff in walking, and he appeared to get about with difficulty No changes were found in the electric reactions of the muscles The voice was somewhat husky, but examination with the laryngoscope did not reveal any abnormality of the vocal cords

The case might possibly be classed as one of electric chorea, the history points to its being of neurotic origin

A CASE OF INFANTILE HEMIPLEGIA WITH ATHE- TOSIS BY LT-COL F J DRURY, I M S

The patient, a boy, aged 12, was admitted into the Medical College Hospital with well-marked hemiplegia of left side There was a history of some severe febrile illness six years previously, *i.e.*, at about the age of six During the attack he had convulsions, and on recovery he was found to have lost power of the left side

The left leg was very rigid, the toes were kept dorsiflexed and he had great difficulty in walking The left arm was kept strongly flexed, the wrist also flexed and the hand was kept close to the shoulder There were almost constant athetoid movement of the fingers and thumb of the left hand-flexion Extension and hyper-extension, abduction and adduction, voluntary power in the left upper extremity was much diminished He was also somewhat deficient in intelligence The shape of the head was very peculiar, the right parietal eminence was prominent and reached further back than the left, and in front of this, corresponding to the motor area on the right side, there was evident flattening It was probably a case of atrophy of the right cerebral hemisphere

ANNUAL REPORTS

THE REPORT OF THE CIVIL HOSPITAL, SECUNDERABAD

LT COLONEL C M THOMPSON, I M S, submits the report for 1907 of the work of this hospital There is accommodation for 25 Europeans and 70 Natives The foundation stones of three new buildings were laid by H E Lady Minto in November last, there are a Parsi and European ward for 16 patients, a children's ward for 15 patients and a "Caste" Dispensary with two separate wards for caste ladies Besides this, quarters for 16 nurses are being built

The Superintendent gives the following account of the operative work done in the hospital during the year 1907—

"During the year there were 162 major operations performed

The list of operations is given in Table No. II A

The list includes abscess of liver 16, ovariectomy 3, hysterectomy 1, cesarian section 1 (mother and child saved), obstetric operations (25)

Exclusive of obstetric operations, the mortality after operations was 10.6 as compared with 13.7 in the previous year In my report for the year 1901, I expressed the opinion that as the nursing staff increased and their knowledge of aseptic procedure improved, there would be a gradual diminution in the percentage of mortality after operations

This presumption has been realized, as will be evident from the recorded results for the last four years—

Mortality after operations

1904	1905	1906	1907
13.82	13.3	14.06	10.4

As I have previously pointed out, a comparison cannot be fairly made between the results in an Indian Hospital and a thoroughly up to date London Hospital, because the natives of this country are very much opposed to surgical operations, and very often only agree to undergo an operation when it is too late to hope for a successful result The number of serious operations performed in this hospital is steadily increasing as the people are gaining confidence in it

The obstetric work of this hospital has always been good and would be better if only the women would come into hospital in good time He writes—

"There were 150 cases of confinement admitted to the Curzon Maternity Ward during the year—

Europeans and Eurasians	29
Natives	121
Total	150

The number of obstetric operations performed was 25 with 7 deaths The seven women who died had been in labour for several days before admission, and were in an almost hopeless state when admitted There was no death amongst women who came into hospital before the commencement of labour, although there were several very difficult and serious cases amongst these women This is an important point, and one which it would be well if the poor women of Secunderabad could be made acquainted with The risk of confinement is practically nil, provided the women come to hospital in time

THE CHEMICAL EXAMINERS REPORT, PUNJAB

LT COLONEL D ST J GRANT, M.B. (Dub.) I.M.S., submitted this Report for the year 1907. We quote the following extract —

Excluding 12 cases of abortion, there were 355 cases of human poisoning, and the following table shows the nature of poisons detected —

Poisons detected	Total	Fatal	Non fatal
Arsenic	121	63	58
Opium	45	37	8
Datura	23	5	18
Alcohol	13	10	3
Indian hemp	10	4	6
Aconite	4	4	
Morphia	4	4	
Opium and alcohol	1	1	
Morphia and alcohol	1	1	
Opium and mercury in solution	1	1	
Opium and arsenic	2	2	
Opium and bang	1	1	
Arsenic and datura	1	1	
Arsenic and bang	1	1	
Mercury in solution	1	1	
Waxy phosphorus	1	1	
Some strong alkali	1	1	
Vegetable bitter nauseous principle sug- gesting aloes or kaner	1	1	
Metallic mercury	11		11
Sub chloride of mercury	1		1
Remains of a dead rat	1		1
Powdered glass	1		1
Sulphate of copper	2		2
Copper in solution	1		1
Aloes	1		1
Zinc sulphate	1		1
Total	251	139	112

"Arsenic which is commonly used for homicidal purposes amounts to 43.21 per cent on the total detections, as compared with 54.22 per cent in 1906 and 53.47 in 1905. Opium comes next, it amounts to 19.52 per cent on the total detections against 19.36 in 1906. Datura amounts to 9.16 against 9.51 in 1906. Alcohol and Indian hemp put together amount to 9.16 per cent as compared with 6.69 in the year before.

Considerable alarm among the villagers was excited by persons maliciously throwing material into wells, with regard to the nature of which extravagant rumours existed. In several instances the material seized in the possession of these people was submitted for examination, but in all cases was found harmless, their object apparently being only to act on the imagination. In one case, however, a dead rat was thrown into a well, even had this been a plague rat, it is not likely that much harm would have been done. But the act was one calculated to excite disgust and fear."

"During the year under report nine cases were received in which burnt bones and ashes of the poisons suspected to have died of poisoning were sent for analysis. In one of these cases arsenic was detected in the ashes, and in another case arsenic was found in the vomit only of the deceased sent along with ashes.

In cases of suspected organic poisoning where the body is incinerated, the ashes, etc., are sometimes sent for analysis. It is quite useless to send such cases for analysis, as the strong heat of funeral pyre destroys all chances of detection of this class of poison. In one case the medical officer, on being asked by Police to send the ashes, etc., in a case of opium poisoning for analysis, wrote them to say that it would be futile to search for opium in burnt ashes, but was informed in reply that the case should be sent up for analysis as the Police Rules required it.

In a case of accidental poisoning, a party of marriage procession was served with "palao" (rice and meat) with the result that almost all of them who partook of the meal, became sick, the cooks were suspected, on analysis the "palao" was found to contain copper in solution which may have been derived from the cooking vessels."

The Inspector General, Colonel T. E. L. Bate, C.I.E., I.M.S., in his founding letter makes the following remarks —

"Up to the close of last summer session, Colonel Grant filled the combined chair of chemistry and physics in the Medical College, and it is due to him to say that during the many years he was associated with medical education in the province, he did much to raise the standard of knowledge of the subjects he taught. Colonel Grant still lectures on

toxicology to third year students, but his close association with the College no longer exists.

There has been a project for building a new chemical laboratory under consideration for a long time, it has been greatly delayed, owing to the difficulty of finding a suitable site for the building in Lahore. I have urged Colonel Grant to come to some conclusion on the point, as improvements required in the arrangements of the Medical College are postponed pending the removal of his laboratory, which is now housed in a College building."

THE CHEMICAL EXAMINER'S REPORT, BENGAL

MAJOR J. BLACK submits this report which is full of interest. The following notes of cases of poisoning are worthy of a wider publication than that afforded by this official report —

NOTES ON POISONING CASES

Assistant-Surgeon Ravi Churn Lal Bose, Bahadur, who is responsible for the Medico-legal Department, contributes the following interesting notes on selected cases —

Arsenic poisoning (absence of usual symptoms) — A case in which death was ascribed to cholera was referred by the Civil Hospital Assistant of Arraria in Purnea. A Hindu woman was reported to have died from the effects of a berang. On post mortem examination, the Hospital Assistant found no external injury, nor did he observe any redness or congestion of the viscera. The stomach contained a little odourless fluid, and the intestine some whitish faecal matter like rice water. Arsenic was detected in marked quantity in the viscera.

Arsenic poisoning (homicidal) — The body of an unknown female was found in a sack on the bank of the river Hooghly in Calcutta. On post mortem examination the mucous membrane of the stomach was found softened and eroded. The organ contained a yellow powdery deposit.

Arsenic in fatal quantity was discovered in the viscera.

The woman could not be identified.

Aconite poisoning — A case of aconite poisoning occurred in Calcutta in November 1907. The history of the case as furnished by the Commissioner of Police was that the deceased Etwaru Kumar, Simla Bazar, lived with his mistress Jhala, but owing to quarrel they separated for a few days. On the night of the 26th November, the deceased complained to the darwan of the Bazar that he had been feeling unwell since taking his meal served by his mistress Jhala who had renewed the intimacy with him that evening and invited him to a dinner. He was removed to the Medical College Hospital where he died soon after admission.

The Police Surgeon who held the post mortem examination found congestion of the mucous membrane of the stomach, there were no food particles in the organ. He drew some urine from the bladder of the deceased and sent it along with the viscera for chemical examination. Aconite was detected in the urine, but not in the viscera.

Aconite was also detected in the vomit of the deceased.

Aconite poisoning (accidental) — A cooly at Howrah, while unloading sacks containing aconite root, ate some of the root, believing it to be a tonic medicine. He shortly after fell ill, and was taken to the Medical College Hospital, where he died soon afterwards. The stomach was found inflamed and the kidneys congested.

Aconite was found in the viscera and stomach washings. The root was identified as Aconite.

Datura poisoning (with robbery) — A case of drugging by Datura for facilitation of theft was reported by the Civil Hospital Assistant of Siwan. The victim, a Hindu male, got down from a Railway train at Siwan on the evening of the 2nd January 1907. He went to a wadi's shop where he purchased some food and ate it. Soon after he became unconscious, and was robbed of all his money. He was afterwards discovered by the Police and removed to the hospital where the following symptoms were noticed — Pupils dilated, articulation broken, trying to catch at imaginary objects in the air, dryness of the tongue and throat, delirium present. He recovered in two days. The stomach washings were sent for chemical analysis and atropine was detected in them.

Datura poisoning — Another case of theft by drugging was referred by the Civil Hospital Assistant of Siwan. Two men became delirious and unconscious after taking a meal served by a servant, who forthwith decamped with all their valuables. On admission into the Hospital, the following symptoms were noticed — Face flushed, pupils dilated, tongue and throat dry, eyes congested, pulse, full and slow. One of the men had complete loss of speech, the other had broken articulation and delirium. The vomit of the two patients and some remnants of food were sent for analysis and atropine was detected in them.

Yellow Oleander poisoning (suicidal) — A Hindu girl had a quarrel with her husband on 8th June 1907, she took no food on that day. When her husband returned at 10.30 P.M. she was

ill and vomiting. Shortly afterwards she fainted and expired. The Police Surgeon of Calcutta, who held the *post mortem* examination, found the mucous membrane of the stomach of a dull red colour and congested in parts. The blood was found to be of a rather bright red colour. The viscera were forwarded for chemical analysis and yellow oleander was detected in them. Some bruised seeds which were found in the room of the deceased and a curry stone and a stone muller which were suspected to have been used for pounding the poison, were also sent for examination. The bruised seeds were found to be yellow oleander seeds, yellow oleander was detected in the stains on the curry stone and stone muller.

Oxalic acid poisoning (suicidal)—A European soldier of the 5th N Fusiliers was found groaning and vomiting at 11.30 A.M. on the 15th February 1907. On being questioned he admitted having taken oxalic acid. He died soon after arrival at the hospital. The mucous membrane of the oesophagus was found softened, and a large quantity of bloody fluid mixed with some black grains was found in the stomach. The viscera of the deceased were forwarded for chemical analysis by the Police Surgeon, Calcutta, and oxalic acid was detected in them. An enamelled tumbler found in the room of the deceased, contained a white crystalline deposit which on analysis was found to be oxalic acid.

Carbolic acid poisoning (suicidal)—A young Brahmin girl was seen by her husband to leave her bed at 11.30 P.M., but returned shortly afterwards when it was noticed she was smelling of carbolic acid. She grew ill and was removed to hospital where her stomach was washed. She died within three hours. At the *post mortem* examination by the Civil Surgeon of the 24 Parganas, the following signs were found: dark stains at the angles of the mouth and on the inner surface of the lower lip, several white patches on the tongue and the papillae at the base of the tongue were prominent. The mucous membrane of the gullet throughout its whole length had a white and rough appearance and excoriations were observed on it. The mucous membrane of the stomach was of brick red colour, thickened and inflamed, covered with erosions at parts. It contained 15 ounces of a red coloured fluid which had a faint smell of carbolic acid. The viscera of the deceased as well as the washings of her stomach were forwarded for examination and carbolic acid was detected in them.

Phosphorus poisoning—The Civil Surgeon of Darjeeling referred the case of a Gurkha boy, aged about 12 years, who it was alleged swallowed some food mixed with poison used for killing rats and died in consequence. The *post mortem* examination showed that there was congestion of the mucous membrane of the stomach throughout especially at the pylorus with some denudation of epithelium. The vessels of the stomach were engorged, the stomach contained about an ounce of thick pink coloured mucus. The intestines were congested, the contents were muco sanguinous. There were 19 round worms in the small intestine. All the internal organs were congested, the liver was found enlarged and fatty at places on the surface, the pupils were dilated. The stomach and its contents, the contents of small and large intestines and washings of the stomach of the deceased removed at the hospital were forwarded for chemical analysis, and phosphorus was detected in them.

Chloral Hydrate poisoning (overdose)—A Eurasian lady was in the habit of taking chloral sleeping draughts. On the 24th July she said that she was going to take a dose of the draught that night. She was found dead on the following morning. About 12 ounces of a blackish brown fluid, with oil globules floating in it, were found in the stomach of the deceased. The stomach contents had a faint sweet smell like apples, the brain was found congested. The Police Surgeon of Calcutta forwarded the viscera for chemical analysis and chloral hydrate was detected in them. Two glass phials containing chemicals found in the room of the deceased were also sent for examination. One of these contained a small quantity of chloral hydrate and the other a solution of camphor in chloroform.

Croton oil poisoning (non fatal)—The Civil Surgeon of Hazaribagh referred a case in which a European gentleman and his wife showed symptoms of irritant poisoning after dinner. The symptoms were vomiting and purging. The vomit and the dejecta of both the persons and some boiled rice which was suspected to have been mixed with poison, were forwarded for analysis. Croton oil was detected both in the vomit and in the dejecta of the two persons, no poison was found in the boiled rice.

Wild olive poisoning—The Civil Medical Officer of Kurseong sent some wild olives preserved in lime juice, which a Eurasian boy, 15 years old belonging to the Victoria School at Kurseong, ate on 15th November. The boy was taken ill on the 16th with acute vomiting, and died on the 17th. Other boys were reported to have eaten the same olives without ill effects. The olives were found to possess irritant properties. A small quantity of the extract of the olives was administered to a cat. The animal vomited several times but ultimately recovered. The nature of the irritant principle could not be determined.

Current Literature.

PROTOZOOLOGY *

Insect Flagellates—By CAPT S R CHRISTOPHERS, I.M.S.

It is now well known that many insects harbour in their alimentary tracts flagellate organisms of two distinct genera *Herpetomonas* and *Critidia*. The earliest known of these flagellates is *Herpetomonas muscae domesticae* commonly found in the house fly in many parts of the world. This parasite was first named *Bodo muscae domesticae* by Burnett and others. Kent, however, placed it in his new genus *Herpetomonas* including with it the flagellate found by Lewis in the blood of rats in India. Later, when these flagellates came to be studied more carefully, it was shown by Laveran and Mesnil that the *Herpetomonas* of the house fly differed markedly from the *Herpetomonas* of the blood of Indian rats and that the latter was a true *Trypanosome* and was, therefore, placed in the genus *Trypanosoma* of Gruby. The name *Herpetomonas* was retained for the parasite of the house fly and it is now the type species of the genus. Since the discovery of these facts a large number of flagellates have been found both in blood-sucking and non blood-sucking Arthropods, and two important papers have been published, one by Ross in 1898 and the other by the late Dr Schaudinn in 1904. Ross found a large number of flagellate organisms in mosquitoes of the genus *Culex* not only in the adult insect but in the larva and pupa, a fact which clearly indicated their nature. Unfortunately this paper was entirely lost sight of by subsequent observers, and as a result there is at present considerable confusion regarding the life histories of these parasites.

In 1904 Schaudinn published his remarkable memoir on the evolution of *Trypanosoma noctuae* in *Culex pipiens*. Although at first this work was generally accepted it soon became evident there were grave sources of error in Schaudinn's experiments. Ross, Novy, MacNeal and Toirrey have recently pointed out that although Schaudinn referred to Leger's observations on *Critidia fasciculata* from *Anopheles maculipennis*, he makes no mention of the similar parasites of *Culex* mosquitoes, and as the species *Culex pipiens* which he was dealing with was presumably captured at large at Rovigno, it was necessary to first exclude the possibility of its harbouring these natural flagellates. Schaudinn's work has led to the erroneous belief that these insect flagellates when occurring in blood-sucking insects represent the further development of some unknown *Hemoflagellate*.

Ross when carrying out his memorable observations on the evolution of the malarial parasites of birds in mosquitoes found flagellates in a mosquito (*Culex*) which had fed on birds infected with *Halteridium* and *Proteosoma*, and on examining another mosquito which had not fed on the birds he found similar flagellates and also their earlier stages in the alimentary tracts of its larva and pupa. He rightly concluded that they had no connection with the *Hemocytozoa* of birds, but were true insect parasites and that the infection was probably acquired by the larvae. I have been able to confirm these observations of Ross and in a recent paper I gave a short account of the life cycle of a species of *Herpetomonas* which is commonly found in *Culex quasi-pipiens* and *Culex fatigans*. The larvae of these mosquitoes ingest the cysts which are passed out by the adult mosquitoes, and on passing down to the lower end of the small intestine, they multiply rapidly, either dividing by simple binary fission or by multiple segmentation, in the nymphs further

* Extracts from the Report of the King Institute of Preventive Medicine, Madras, 1907.

development takes place, some of the parasites flagellate while others develop into rosettes of from twenty to more flagellates. In the adult mosquito the majority of parasites have already become flagellates and three days later they begin to pass down to the rectum and on becoming attached in rows by their flagellar ends they shorten and divide at the same time the flagella are shed. They now become rounded and are often full of large chromatoid granules which may obscure the nucleus and blepharoplast, they are surrounded by a well marked periplast which stains pink with Giemsa's stain. These cysts are eventually passed out in the faeces of the mosquito probably when it is laying its eggs in water and identical bodies can be found in the larvæ so that there can be little doubt they are ingested at this stage. These observations bring out some points of importance. Although these mosquitoes particularly *Culex fatigans* suck human blood, and that of a number of animals this *Herpetomonas* has no connection with any blood parasite, but passes its complete cycle in the mosquito, its structure and life cycles at once suggest that of the parasite of Kala Azar. The similarity between the flagellate stages of the two parasites is obvious, but the resemblance of the non flagellate stage of *Herpetomonas* to the well known human parasite is less widely recognised. Still more recently I have succeeded in finding a new species of *Herpetomonas* in the alimentary tract of the Lygaeid bug *Lygaeus militaris*, which is almost identical with the Leishman Donovan body. The cysts as in the case of *Herpetomonas* mentioned above are ingested by the bugs, adults or nymphs, they divide twice by simple longitudinal division resulting in characteristic groups of four bodies, those latter flagellate and after remaining an indefinite time in the upper part of the alimentary tract of the bug pass down to the rectum where they encyst. They shorten and divide about three times, the flagella being shed at an early stage and the resulting bodies are very like the Leishman Donovan parasite. They are passed out in the faeces of the bug and are again ingested by other bugs. A similar process of division has been observed in the later stages of the development of the parasite of Kala-Azar in *Oimex rotundatus* which suggests that it passes back to its non flagellate stage in the bug probably in its pharynx and is then reintroduced into man. A full account of this *Herpetomonas* will shortly appear in the *Archiv für Protistenkunde*.

The following species of *Herpetomonas* have been found to be common here —

<i>Herpetomonas muscæ domesticæ</i> (Burnett)	in <i>Musca domestica</i>
" sp ?	in <i>Lucilia</i> sp
" <i>Sarcophagæ</i> (Prowazek)	in <i>Sarcophaga</i> sp
" sp ?	in <i>Stomoxys</i> sp
<i>Herpetomonas lygaei</i> (Patton)	in <i>Lygaeus militaris</i>
" sp ?	in <i>Culex fatigans</i> and <i>Culex quasi pyrenis</i>
" sp ?	in <i>Ctenocephalus felis</i>

In their adult flagellate stages all these parasites are characterised by the complete absence of an undulating membrane, the single flagellum having a short intracelular portion owing to the blepharoplast occupying a position almost at the anterior end. As far as it is possible to say at present, at least three of these *Herpetomonas muscæ domesticæ*, *Herpetomonas* sp ? from *Lucilia* and *Herpetomonas sarcophagæ* are closely allied and should be grouped together. *Herpetomonas lygaei* is more closely related to the Leishman-Donovan body, while the *Herpetomonas* of *Culex pyrenis* occupies an intermediate position. As our knowledge of these flagellates increases, it will undoubtedly be found necessary to further subdivide the genus into one or more subgenera, but in the meantime it will be wisest to place them all in the genus *Herpetomonas* of Kent.

In addition to these flagellates certain insects are infected with another type for which Leger has created the genus *Crithidia*. In a paper which will shortly be published in the *Archiv für Protistenkunde*, I have given a complete account of one of these parasites, *Crithidia gerardi*, which I found in three water bugs.

It will be remembered Leger in his description of *Crithidia fasciculata* based the generic name on the short ant-like appearance of the parasite of *Anopheles maculipennis*. This stage, as I have pointed out in my paper on *Crithidia gerardi* is undoubtedly a young form of the parasite, and as the immature forms of many *Herpetomonas* have very much the same appearance, it is not possible to distinguish between the two, especially when they both occur in the same insect. The adult flagellate of *Crithidia* is very characteristic, the anterior end instead of being blunt as in *Herpetomonas* is attenuated being drawn out along the flagellum to which it is attached by a narrow undulating membrane. Further, the blepharoplast is always situated much closer up to the nucleus than in the adult flagellate of *Herpetomonas*. Throughout their life cycles these *Crithidia* have their blepharoplasts either at the anterior end or close up to the nucleus and in some instances posterior to it. The generic name *Crithidia* is therefore an unfortunate one as it does not accurately describe the peculiar structure of the parasites.

Recently Novy has studied the flagellates found by Koch Gray and Tulloch in *Glossina palpalis* in Uganda, he believes these flagellates are true insect parasites and have no connection with *Trypanosoma gambiense*, he bases this view on the following facts —

(1) The flagellates have been found in flies which had not fed on infected animals.

(2) The failure to obtain any development of the trypanosomes ingested by flies fed on infected animals as well as the many failures to infect susceptible animals with these flagellates.

(3) Their analogy with the flagellates of mosquitoes. To this may be added Minchin's observations on the encysted stages of one of these flagellates, *T. Grayi*, in the rectum of *Glossina palpalis*.

A study of the figures of *T. Grayi* given by Novy, Minchin and Gray clearly suggest that this flagellate is more closely related to *Crithidia* than to the true trypanosome of vertebrates, a comparison of these figures with those of *Crithidia gerardi* further supports this view. *Trypanosoma grayi* exhibits the same pleomorphism in its adult stage — long thin forms with free flagella measuring up to 48 μ as well as short stouter forms being seen. From our present knowledge of this parasite it is impossible to place it finally either among the *Crithidia* or the *Trypanosoma* and it is quite possible the other flagellate named by Minchin *Trypanosoma tullocki* is but a state of *T. grayi*. Until the complete life cycles of these parasites are worked out, these points must remain *sub judice*.

A similar trypanosome like flagellate, *Trypanosoma Christophers* (Novy), has been found in the dog tick *Rhipicephalus sanguineus* in Madras by Captain Christophers 1908, it is not possible to say whether it is a natural parasite or the development of a vertebrate form.

In summing up our present knowledge of these flagellates the following should be noted — A large number of insects blood sucking and non blood sucking have natural flagellates in their alimentary tracts and are in no way connected with vertebrate *Hemoflagellates*. The methods by which these insects acquire the infection varies according to the particular insect. In mosquitoes the larvæ ingest the cysts so that when they hatch out into adults, they have the flagellates in their alimentary tracts, in the case of flies I have found that the larvæ also ingest the cysts and that here the early stages of the parasite should be looked for in the alimentary tracts of the larvæ. In non blood sucking flies, such as *Musca domestica*, *Lucilia*, *Sarcophaga* the cysts are ingested by the adult insects. In blood sucking flies, such as *Stomoxys* and *Tsetse* flies, as well as in ticks the method of infection is not clear. A species of *Stomoxys* observed here after sucking blood has the habit of sitting on shrubs close to its host where it deposits its faeces, the question which naturally suggests itself is whether the flies at any time suck up any of the

feces and thus become infected? I am, however, inclined to think the larvae ingest the cysts. This point is of some importance as in the case of *Isetia* flies which only suck blood, Minchin suggests the encysted stages of *T. grayi* are probably ingested by some vertebrate, this can, however, hardly be the case. The larvae of these flies should be examined for the early stages of these flagellates. In the case of ticks it would seem necessary for the parasites to pass to the ova and thus be transmitted hereditarily because ticks only feed on blood in all their stages, and further, there is no means as far as I am aware for the encysted stages to pass out of the ticks. I have been able to confirm this theory in the case of a flagellate I recently found in a species of *Hæmaphysalis* probably *H. Neumanni*, Donitz* very common on *Lepus nigricollis*. The flagellates pass to the ovaries and can be followed through the ova to the young larvae where they rapidly develop into flagellates 12 hours after dropping from their host. This interesting parasite will be described in detail later. Bugs whether terrestrial or aquatic become infected either by the nymphs or adults ingesting the encysted stages.

The study of these natural flagellates is of great importance as they are veritable obstacles in the investigation of the development of *Hæmoflagellates* in blood sucking insects, and as I have shown above they will undoubtedly throw further light on the parasites of Kala-Azar and Delhi Boil.

Mammalian Leucocytozoa.—By CAPT S R CHRISTOPHERS, M B, I M S

Within the last few years a number of parasites which have been classed with the *Hæmogregarinidæ* have been discovered in the white blood cells of various mammals. Their affinity to the well known endoglobular parasites of cold-blooded animals is chiefly based on the appearance of the parasites in the peripheral blood. Although the *Hæmogregarinidæ* are by far the commonest endoglobular parasites, they are very imperfectly known, a reference to Dr Sambon's† recent list some 80 species, reveals the fact that except in the case of twelve their *Schizogony* and *Sporogony* is now unknown. At the present time there is no certain information regarding the extra-corporeal life histories of the cold blooded forms. Hintze's observations on the *Sporogony* of *H. minima* is now universally believed to be incorrect, and probably represents part of the cycle of a species of *Coccidium* parasitic in the intestinal tract of *Rana esculenta*. Siegel's account of the *sporogonic* cycle of *H. stepanovi* in *Placobdella catiniquera* has not been confirmed, Brumpt‡ has recently pointed out that the thread like *sporozoites* described by Siegel are true leech *spirochetes* and have no connection with *H. stepanovi*. I have fully confirmed this observation of Brumpt as I have found these *spirochetes* in the two leeches common on frogs in Madras. In last year's report (Appendix XI) Captain Christophers, I M S, gave a short account of the sexual cycle of *Leucocytozoon Canis* in the dog tick *Rhipicephalus sanguineus*, since then a memoir describing the process in detail has been published.

It is not yet certain whether the method of reproduction of the *Hæmogregarinidæ* in their vertebrate hosts is an asexual or sexual process. Labbe's observations on the *hæmogregarines* of frogs suggest it is a specialised form of *Schizogony* and Lutz's work on the *Hæmogregarines* of snakes supports this view. It therefore seems somewhat premature to attempt to classify these parasites as Dr Sambon has done on the doubtful assumption that they produce "sporozoites in secondary cysts or spore bags."

The *Schizogonic* cycles of these parasites required to be worked out in greater detail and at the same time the exact nature of the various forms seen in the peripheral blood need to be ascertained, such information will not only materially help in classifying the *Hæmogregarinidæ*, but will also throw some light on their extra-corporeal cycles.

I have had the opportunity of studying three of the peculiar mammalian forms two of which *Leucocytozoon felis domesticæ* and *Leucocytozoon leporis*, are found in Madras, and the third, *Leucocytozoon funambuli*, in Kathiawar.

Leucocytozoon funambuli.—I have described this parasite fully in an earlier paper, recently through the kindness of Captain Coppinger, I M S, who sent me a large number of squirrels, *Funambulus pennanti*, from Rajkote I have been able to study it further. It will be remembered that after an exhaustive search in the liver, spleen and bone marrow I failed to find its method of reproduction in the squirrel, I had however omitted to examine the lungs where the *schizogony* alone takes place. A short description of this cycle is as follows.—

The parasite on leaving the large mononuclear leucocyte enters an alveolar epithelial cell and soon loses its vermicular shape. The epithelial cell becomes hypertrophied and stains a deep pink with Giemsa's stain. The parasite on becoming round displaces the nucleus of the cell to one side, at the same time a cyst wall forms not only round the parasite, but also round the whole cell. Important changes now begin to take place in the nucleus of the parasite, it divides up into a number of chromatic filaments which are often seen bent in the shape of the letter U, this appearance suggests that the nucleus divides mitotically. On the formation of the two nuclei they separate and soon begin to divide, this process continues until the cyst becomes studded with nuclei, its protoplasm is full of granules of various sorts. When fully mature, it occupies the whole of the cell, the nucleus of which being compressed atrophies, it now contains as many as 200 oval bodies which can be readily distinguished from the mature parasite I have already described. In an heavily infected animal the capillaries of the lung are found to be full of these young forms. There is no sexual dimorphism. The *schizogony* of *Leucocytozoon canis*, as described by Christophers, is in many ways similar to the *schizogony* of *Leucocytozoon funambuli*, it however takes place only in the bone marrow of the dog and the number of merozoites are much smaller.

This method of reproduction is quite distinct from that of *Hæmogregarines* which occur in red blood cells, as the *Hæmogregarines* of frogs and snakes. This fact together with the highly specialised nature of the parasite fully justifies its being placed in a distinct genus. It is unfortunate that the name *Leucocytozoon* has been used by Lutz to designate the parasites said to occur in the white corpuscles of the owl (*Athene noctua*). It is doubtful whether these parasites of birds attack white blood corpuscles or immature red cells. We prefer to adopt Laveran's view who regards these parasites as being allied to the *Hæmamebæ*. The name *Leucocytozoon* is therefore best retained for the mammalian forms which are parasites of the white cells alone.

I have again failed to find any extra corporeal cycle in the lice found on *Funambulus pennanti*, and as all the squirrels were infected no feeding experiments were carried out.

Leucocytozoon felis domesticæ.—This is one of the rarest parasites in Madras, after examining 374 cats I have only found it in 9 two of which are now in the laboratory. I have also failed to find any extra-corporeal cycle in the two ecto parasites of the cat, *Ctenocephal felis* and *Hæmaphysalis fusca*, a long series of feeding experiments are now being conducted and so far I have excluded the cat flea and it seems that the tick is the most probable transmitter.

* Professor H B Ward informs me that Mr Swingle, a pupil of his, has also found a flagellate in the American sheep tick, (*Melophagus ovinus*) which is transmitted hereditarily. Pfeiffer has described a *Critidia* from this insect.

† Manson—Tropical Diseases—1907, Appendix by Dr Sambon.

‡ Brumpt—Comptes Rendus Soc Biologie, T LXIII, 20th July 1907.

There are eight possible ways in which it can transmit the parasite as follows —

- (1) Through the nymph fed on an infected cat in its larval stage
- (2) Through the adult fed on an infected cat in its nymphal stage
- (3) Through the larva partially fed on an infected cat, being dislodged and finding its way to an uninfected cat
- (4) Through the partially fed nymph
- (5) Through the partially fed adult
- (6) Through the male tick
- (7) Hereditarily
- (8) Through an uninfected cat eating ticks from an infected cat

Methods 6, 7 and 8 are for many reasons not likely, and the remaining five are at present under investigation

Leucocytozoon leporis — This parasite occurs commonly in the large mononuclear leucocytes of *Lepus nigricollis*. In general appearance it is not unlike *Leucocytozoon canis* and it has a dense capsule which is resistant to most stains. Its method of reproduction is almost exactly similar to that of *Leucocytozoon funambuli* and takes place in the alveolar cells in the lung of the hare. It is being investigated along similar lines as that of the cat parasite, and I hope to give a complete description of it in due course

Batrachian Hemogregarines — By CAPT S R CHRISTOPHERS, M.B., I.M.S.

Hemogregarina berestneffi, *Hemogregarina magna*, *Hemogregarina* sp? and *Hemogregarina minima* were found in a large number of *Rana tigrina* collected from a small pond in Dr Henderson's* garden in Madras, many of the frogs had a species of leech *Clepsina*? on them. This leech was later readily obtained by holding a frog in the water for a few minutes when as many as thirty attached themselves to its legs and body. Another species of *Hemogregarine* allied to *Hemogregarina minima* has also been found in *Rana hexidactyla* taken from a large tank close to the Institute. The small leech could not be found in this tank, but a much larger species was abundant.

A reference to the literature on *Hemogregarines* of frogs shows the fact that except for *Hemogregarina minima* very little is known of their life histories. Hintze has described the sporogonic cycle of *H. minima* which he considers takes place in the intestinal epithelium of *Rana esculenta*. I have been unable to find any such cycle either in the species occurring in *Rana tigrina* or that found in *Rana hexidactyla*. I have also failed to trace any connection between the *hemogregarines* and flagellates frequently seen in the *Clepsina* fed on frogs infected with *Hemogregarines* (vide Appendix VIII). In the intestinal diverticula of the leech 12 hours after feeding on a frog infected with *Hemogregarina berestneffi* the parasites leave the red cells and are seen free. On studying these free forms it was found that the greater part of the long tail-like process figured by Berestneff consists of a loose sheath and does not contain any part of the parasite, after 36 hours the parasite leaves its capsule and then is only about half the size of the characteristic blood form. These free forms are actively motile.

In the case of *Hemogregarina* the mature parasites only leave the red cells after being ingested by the leech and about 36 hours later they pass out of their capsules and are seen as long active vermicules.

It has been found that during the colder months (December and January) this change hardly ever takes place, while in a leech taken from a frog in September the parasites had not only immediately left the red

cells, but had also passed out of their capsules. These observations suggest that the further evolution of the parasites will best be studied during the hot weather when it is hoped to make an exhaustive study of their life cycles not only in the leech but also in the frog.

Batrachian Trypanosomes — By CAPT S R CHRISTOPHERS, M.B., I.M.S.

We owe our exact knowledge of the morphology of the trypanosomes of frogs to the researches of Laveran and Mesnil on the trypanosome of *Rana esculenta*, which was the parasite originally studied by Gluge, Mayer, and Gruby. *Trypanosoma rotatorium vel sanguinis* of Mayer and Gruby undoubtedly exhibits marked pleomorphism in its vertebrate host and as Laveran and Mesnil suggest many of the trypanosomes of frogs described by subsequent observers as distinct species may quite well be special forms of this parasite. *Trypanosoma inopinatum* described by the brothers Sergent has been accepted by most authorities as a new species, this also applies to *Trypanosoma nelspruitense* of Laveran, *Trypanosoma boelli* of Murchoux and Silmbent, *Trypanosoma solomaniense* of Brumpt and *trypanosoma belli* of Nabarro.

Franca and Athias have recently suggested that the species *rotatorium* of Mayer Gruby should be divided into two species: (1) *T. loricatum* or *costatum* (Mayer) in which the body of the parasite is ovoid and the blepharoplast is situated near the nucleus, (2) *T. rotatorium* (Mayer) in which the body is more slender, the blepharoplast is situated at the posterior end and the undulating membrane is well developed.

These observers have also described two new species *T. undulans* and *T. elegans*.

In *Rana tigrina* and *Rana hexidactyla* I have found the typical *Trypanosoma rotatorium vel sanguinis* of Mayer Gruby as well as forms allied to *Trypanosoma mega* and *Trypanosoma laryzenkton* of Dutton and Todd and the *T. undulans* of Franca and Athias. In addition to these forms I have also seen a small trypanosome in the blood of *Rana tigrina* measuring from 27 v to 28 v including the free flagellum which is about 7 v to 8 v in length, its posterior end is markedly pointed and beak like, its body is narrow and the undulating membrane is of medium breadth. The blepharoplast is situated about 25 v from the posterior end, the nucleus is small and oval and lies about the centre of its body. The parasite stains pink throughout and exhibits no striations or granules. It appears to differ from the two other small trypanosomes of frogs *Trypanosoma inopinatum* and *Trypanosoma belli*, I therefore propose naming it provisionally *Trypanosoma hendersoni* after Dr Henderson through whose kindness in obtaining the frogs I had the opportunity of studying this parasite. An interesting question arises as to the possibility of these small trypanosomes having some connection with *Trypanosoma rotatorium*? I have always found *Trypanosoma hendersoni* associated with *rotatorium* and never in large numbers. It is not possible to answer this question finally until the development of the two parasites in leeches is thoroughly worked out, further a large number of feeding experiments would also be necessary to see whether soon after infection it is possible to trace any connection between the two forms. In the blood of *Rana tigrina* and *Rana hexidactyla* infected with *Trypanosoma rotatorium*, I have seen all the curious forms figured and described by Franca, Athias, Dutton Todd and Tobey, it is not possible as yet to say what part of its life cycle they represent.

In the leech (*Clepsina*), more particularly in the embryos, I have been able to study the development of a flagellate, which appears to be a true parasite of the leech. Twenty-four hours after feeding on an infected or uninfected frog round non-flagellated forms are seen lying free in the crop diverticula, in many of these early forms I have seen yellow granules exactly similar to the well known pigment granules

* I wish to take this opportunity of thanking Dr Henderson, Professor of Biology, Christian College, Madras, for his kindness in identifying a large number of animals used in the Laboratory.

of the *Hæmocytozoa* I am not aware that this has been described before. The parasites multiply by longitudinal division and later develop flagella and all the stages from the small, round, non flagellated forms up to parasites with long flagella were readily seen. The flagellates now increase in length and lose their blue staining character and instead turn pink throughout—in all these forms the blepharoplast was always situated either anterior or close up to the nucleus. Except for this fact they were not unlike *Trypanosoma hendersoni*. Owing to the small size of the embryo leeches and their transparent cuticles these flagellates can be readily studied in the fresh condition. They occur in all the diverticula and are not localised to one particular part. One batch of embryo leeches fed on a frog with exceedingly few *T. isolatum* and *T. hendersoni* developed enormous numbers of these *Crithidia*-like flagellates. Owing to the want of time I have not been able to follow these observations further. It is hardly necessary to point out that the flagellates in the leech have no connection whatever with the *hæmogregarines* that happened to be sucked up by the leeches and there is nothing at present to show that *hæmogregarines* have a flagellate stage. In carrying out any feeding experiments with leeches the possibility of latent *hæmogregarine* frog infections must always be remembered.

Brumpt* in a recent paper claims to have shown that the flagellates of leeches, presumably developmental forms of frog trypanosomes, penetrate the eggs of the leech and thus infect the second generation, and the trypanosomes are then found in the sheath of the leech's proboscis. In the leech associated with *Rana tigrina* I have so far not found this method of infection, but my observations are not yet concluded. A large number of feeding experiments in the proper season and the exclusion of possible natural leech flagellates are undoubtedly necessary.

Correspondence

APPEAL FOR FUNDS TO BUILD A HOSTEL FOR INDIANS IN CONNECTION WITH THE PASTEUR INSTITUTE OF INDIA, AT KASAUJI

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—The Pasteur Institute at Kasauli for the prophylactic treatment of persons bitten by rabid animals, has now been open for eight years. The number of patients who apply for treatment has speedily increased from 321 the first year, until now, when from 1,200 to 1,300 are treated annually.

For these people accommodation has to be found, as the Institute itself is practically only a dispensary where patients come daily for their doses. For all classes of Europeans and Eurasians and for poor and indigent Indians suitable accommodation is available and nothing further is required at present. But for Indians of the upper and middle classes there is no proper accommodation, and they are forced to be satisfied with what is available in the serai or elsewhere in the bazaar.

On this account in the past many Indians of these classes, who have come for treatment, have been put to great inconvenience, so much so that on their departure they have promised to do all that lay in their power to forward any scheme which had as its objects the provision of a suitable hostel which would be available for all castes and classes.

The Cantonment Committee of Kasauli have offered a site within easy reach of the Institute, and all that is now required are funds to build.

The sum aimed at is about Rs 15,000. With this amount sufficient sets of suitable quarters could be built and furnished, ample for the present needs of the patients attending the Institute.

I, therefore, earnestly appeal to all Indians for subscriptions for this purpose. I am certain that there are many wealthy gentlemen who are only awaiting an opportunity to help on the good work which the Institute is doing.

* Brumpt—Comptes Rendus Soc Biologie, T LXIII, 20th July 1907

I shall be pleased to receive subscriptions here or they may be sent to the Bank of Bengal, Lahore, marked, "Pasteur Institute Hostel Fund"

I am,
Yours faithfully,
GEORGE LAMB, M D,
MAJOR, I M S,
Director, Pasteur Institute of India, Kasauli

THE DURATION OF THE IMMUNITY CONFERRED BY PLAGUE INOCULATION

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—With a view of estimating the period during which inoculation against plague causes immunity from the disease I have been investigating the results of inoculations carried out in two of the Tahsils of this district during the winter of 1902-03 by Capt Moro, I M S, and Dr Manook. I only investigated the results in villages in which over 50 inoculations were done and in these villages I investigated the death reports until the end of the plague season 1904-05. The results are given in the attached two tables—

In the Shikargah Tahsil out of 1,043 inoculations done in ten villages, nine of the inoculated people died of plague within two years. Five of these died over 18 months later and four of these died within six months. The total population of the ten villages was 5,244, therefore 4,201 people were not inoculated and of these in the same period 272 died of plague.

The percentage of inoculated people who died of plague in the two years is 86. The percentage of uninoculated who died is 6.33. The former figure is much less than the usual percentage of inoculated persons who die of the disease and four of these died when all authorities admit that the full preventative power of the prophylactic was present, five died when the action of the prophylactic is supposed to have ceased.

In the Batala Tahsil out of 1,227 inoculations done in 13 villages, 16 inoculated people died, three of these died two years after the inoculation, four over 18 months after, three under three months after, two of these five days after and one eight days after.

We may assume that the three latter were incubating plague before they were inoculated, so we may leave them out of count and for the purposes of percentage say that 13 deaths occurred among 1,224 inoculations. The total population of the 13 villages was 15,393 therefore 14,179 people were not inoculated and of this in the same period 849 died of plague.

The percentage of inoculated people who died of plague in the two years is 1.06. The percentage of uninoculated who died is 5.9. The former figure is again less than the usual percentage of inoculated persons who die of plague and three died within three months of the inoculation and seven died after 18 months when the action of the inoculation is supposed to be over.

These figures lead me to conclude that the immunising action of the prophylactic remains for a much longer period than is generally admitted and that this action is still strongly in force two years after the inoculation was done. I did not go any further in my investigation as most of the people were re-inoculated for the first time during the following season of 1905-06 when the immunity was strengthened.

None of these people died of plague subsequently to the re-inoculation done then although plague broke out in every one of the villages in question during 1905-6 and 1906-7.

I conclude, therefore, that if the population of a village get themselves inoculated once every second year no other prevention is necessary, and I am also of the opinion that the immunity conferred by a re-inoculation probably lasts much longer than two years although I have no figures to prove this.

If Plague Officers in other districts would go through their records, and if the results in their districts corroborate my investigations, I think a great advance will have been made, as many villagers look very much askance at inoculation when they are told that they must undergo it yearly to retain this immunity, and the measure would be much more popular if we could establish the fact that the immunity is conferred for a much longer period.

C L DUNN,
CAPTAIN, I M S,
Plague Medical Officer, Gurdaspur

QUININE IN PREGNANCY

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—The following cases are interesting—

Mrs S, a young woman of 16 years, had repeated hæmorrhages at the 4th month of pregnancy. She had one abortion last year at the 5th month.

GENERAL CONDITION

The patient is very anæmic, face puffy, œdematous both feet, urine was very scanty and was full of albumen. There is no headache or vomiting.

On examination of abdomen, the uterus reached nearly up to the umbilicus. Fœtal heart sound could not be heard even after repeated examination.

P. V. os was not dilated and there was sanious discharge. Patient refused instrumental delivery.

TREATMENT

Four doses of quinine in seven grain doses were repeated every third hour the first day. After the third dose pains came on which increased gradually. Quinine was continued next day and 30 hours after the commencement of quinine treatment the os admitted two fingers. Ergot was not added to quinine and a hydatid mole was expelled. The uterine was next cleared out.

Next day the urine increased in quantity, the albumen became less and œdematous began to disappear. Patient made a good recovery within a fortnight.

A CASE OF SPLENIC ABSCESS

Rama L., aged 22, was admitted for a painful enlargement of the left side of the abdomen on 18th May 1908.

HISTORY OF THE COMPLAINT

For four months the patient suffered from repeated attacks of fever. He noticed a swelling on the left side two months ago accompanied by pain. Since the appearance of the swelling he gets fever daily in the evening and the swelling has been increasing in size.

PRESENT CONDITION

A young man very anæmic, weak and emaciated. Tongue coated. No appetite. Pulse weak. Temperature rises up to 102° every evening.

There is a swelling on the left side of the abdomen in the splenic region. It extends beyond the middle line and below to a few inches above iliac crest. It is soft and there is a distinct thrill. Manipulation causes much pain. The skin over the swelling is normal.

On exploration, pus was detected and under the usual precautions, the abscess was opened and drained, 5 pints of pus came out, and the swelling rapidly diminished.

After operation the temperature kept up for a few days, but the pain and discomfort disappeared. The condition of the patient improved for some time, but after that fever came on again and owing to the weakened condition of the patient the abscess did not show signs of rapid healing.

Unfortunately, the patient was removed away from the Hospital by the relatives.

Yours, etc.,

SHOLAPUR

Y G NADGIR,

L M & S

RUPTURE OF BLADDER FROM KICK BY A BULLOCK

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR—One Subharan cultivator aged about 30 years, was admitted into this dispensary on the 21st June 1908 with the following history—

On the 15th June at about 4 A.M., while feeding his bullocks, he approached one bullock from behind with the fodder in his arms. The bullock kicked him on the pubes. He fell down and remained unconscious for a few minutes on account of acute pain caused by the injury. At the time of injury his bladder was full, as he had not passed urine since before retiring to rest. He treated himself locally with fomentations and other household remedies. After the injury he passed urine drop by drop until the 6th day when retention took place, for which condition he sought advice.

On admission the penis was found to be very much swollen, the swelling having extended down to the prepuce, and caused marked phimosis. Over the pubes there was a swelling about the size of a cricket ball boggy in feel, the skin over it being livid. A soft catheter No. 9 was passed with great difficulty, and clear but offensive urine was drawn off. Next morning the swelling on the pubes was incised and gave vent to stinking urine and breaking down blood clots. After this there was a continuous flow of urine from the wound, no urine being passed *per urethram*. On the morning of the 23rd (on the 9th day) the Civil Surgeon, Major W. D. Sutherland, saw him and decided to operate as it was evident that rupture of the bladder, probably extra-peritoneal, had occurred. The parts were much congested and hæmorrhage was profuse, and controlled with some difficulty. The ruptured spot in the bladder wall could not

be detected, so the Crum Retzius was plugged with gauze and the wound treated by the open method. The inflamed tissues sloughed and left a large granulating surface in the hypogastrium and over the pubes which slowly healed, a few skin grafts being applied. The patient passed urine through the wound until the 1st of August, and was discharged cured having been in hospital for 52 days. This case appears to be of interest owing to the long period passed before active treatment was applied. The temperature chart showed that an immediate fall to nearly normal followed operative measures.

Yours, etc.,

L N CHOUDHURI,

SAUGOR C P

Assistant Surgeon, Main Dispensary

Service Notes.

COLONEL D WILKIE, M.B., I.M.S. (Bengal), Inspector General of Civil Hospitals, Eastern Bengal and Assam, is granted privilege leave for three months and in continuation leave out of India for three months, under paragraphs 222 and 226, Army Regulations, India, Volume II, with effect from the 2nd October 1908.

Lieutenant Colonel R. N. Campbell, M.B., I.M.S. (Bengal), Civil Surgeon, Dacca, is appointed to officiate as Inspector General of Civil Hospitals, Eastern Bengal and Assam, during the absence on leave of Colonel D. Wilkie, M.B., I.M.S. (Bengal), or until further orders.

The news of the retirement of Colonel David Wilkie has been received with universal regret in Assam and Eastern Bengal where his kindness of heart and his appreciation of good work had made him much respected and liked by all Civil Surgeons in that province.

Colonel Wilkie was born in June 1849 and his first commission dates from 1st April 1873. He was first in civil employ in the United Provinces and for some time in the Jail Department there, when he published a valuable pamphlet on prison dietaries. He then was appointed Statistical Officer to the Government of India in the Medical and Sanitary Department and for many years was responsible for much of the Report and all the statistical returns given in the Annual Reports of the Sanitary Commissioner with the Government of India.

In 1914 Colonel Wilkie became Sanitary Commissioner and P. M. O., Assam, and, on the formation of the new province in October 1905 of Eastern Bengal and Assam, he became Inspector General of Civil Hospitals in the enlarged province, the military duties of his former post going over to the P. M. O. Presidency Brigade and the Sanitary duties to the newly created Sanitary Commissioner, Eastern Bengal and Assam.

Colonel Wilkie is succeeded in Eastern Bengal and Assam by Colonel R. Neil Campbell, M.B., I.M.S., whose appointment to this post will be very popular with the whole province. Colonel Campbell was born in September 1854, and will get the Colonel's promotion *pucca* from 1st April 1909, the date of the expiry of Colonel Wilkie's leave.

Colonel Campbell is well known in Assam and in Eastern Bengal. In Assam he served as Civil Surgeon for many years and was extremely popular among both the official and planting community. For several years past he has been Civil Surgeon of Dacca, one of the most lucrative posts belonging to the Indian Medical Service.

Colonel Neil Campbell's first commission dates so far back as 1st October 1877, so that he has no less than 31 years' service and will have 31½ years service before getting permanent promotion. This shows the terrible stagnation of promotion at present in the service.

On the recommendation of the Government of India, His Majesty's Government have been pleased to confer a good service pension on the undermentioned officer, with effect from the date specified—

From the 1st April 1908, in the room of Surgeon General W. R. Browne, M.B., C.I.E., Indian Medical Service, retired.

Surgeon General John Philip Gloag, M.D., I.M.S., Surgeon General Gloag, who gets his good service pension, has gone home pending retirement, therefore his good service pension of £100 per annum will only last from 1st April 1908 to date of retirement.

THIS is one of the pensions explained at p. 480 of the *Indian Medical Gazette* for December 1905. There are 50 such of £100 per annum distributed between the Indian Army and the Indian Medical Service. Practically speaking they are given to Surgeons General only, and now a days, only last during the period of active service and cease on retirement.

They are not to be confused with the four extra or compensation pensions given, which are available only to men who entered the I M S, before the Examination of August 1889. These extra or compensation pensions (See A R I Vol I, pt 1, Art 1473) are given in the proportion of two for Bengal and one each for the Madras and Bombay services as compensation for the withdrawal of the rank and privilege of a Colonel formerly conferred on officers of that service holding the appointment of Sanitary Commissioners. These extra pensions will be offered years in rotation to Surgeon General Colonels and to all Lieutenant Colonels specially selected for increased pay.

These pensions may be given to Surgeons General or Colonels, but only when from failing health &c, he is unable to complete his full long service.

It is important to note that if the full number of pensions offered are not accepted in any one official year, the balance will lapse and will not be offered during the following year.

We have again directed attention to these extra compensation pensions because we are of opinion that one result of the new rule of pension in force from 2nd August 1908, of £600 a year, at 27½ years service for pension, will be to make a keen competition among Lieutenant Colonels on the selected list for this compensation pension. A man who can get £910 + £100 pension at 27½ years service will often not care to stay on much longer. It is extremely difficult, therefore, to foresee who these lucky persons will be, the more so on account of the different dates men calculate service for pension.

We have observed from correspondence received that this point is not clearly understood.

As we said (Dec I M G, 1905, p 480) the anomaly exists that whereas the "Memorandum regarding the position of officers appointed to His Majesty's Indian Medical Service" says "service for pension reckons from date of first commission," i.e., from joining the Medical Staff College, which take the place of the Netley of older days this only applies to recently joined officers.

1. Officers who joined up to and including those who entered Netley on 31st March 1890 count service for pension as follows: the four months at Netley are counted, but the two, three, or four months between passing out of Netley and arrival in India are cut out and not counted as service for pension.

2. In 1890 owing to agitation on the part of the Army Medical Staff, this privilege of counting the four months at Netley as service for pension and for promotion was abolished and the men who passed the I M S entrance examination of August 1890, who would otherwise have been commissioned for the 1st October 1890, found their commissions, dated from date of leaving Netley, viz., 23rd January 1891, i.e. lost four months' "service for promotion" and we presume they also lose as "service for pension" the holidays enjoyed between leaving Netley and landing in India.

3. The third category consists of those who joined in 1903 and after whose commissions date from day of joining the Staff College and therefore whose service for promotion and service for pension, both date from the unmistakable date of their first commission.

It does not seem satisfactory to leave this anomaly existing. We say let all service for promotion and for pension date from date of first commission and make one rule for all from the Director General to the most junior Lieutenants.

MAJOR J A BLACK, M D I M S, is appointed *sub pro tempore*, Chemical Examiner, Bengal *vice* Major Bedford, I M S, on deputation, with effect from 29th July 1907.

The next two Civil Surgeons of Simla will be Major Melville, I M S, a Civil Surgeon, U P, and Captain Leicester, F R C S, who has been for several years past Resident Surgeon of the European General Hospital, Calcutta.

The services of Captain G Fowler I M S has been confined to Civil employ in the Central Provinces with effect from 11th April as a Civil Surgeon 2nd Class, *vice* Lieutenant-Colonel H C Bratfalia promoted to 1st Class.

MAJOR A W R COCHRANE I M S, Snrdr of the Lunatic Asylum Agri, was granted one month's privilege leave in September.

On being relieved, Captain E J O'Meara, I M S reverts from acting as Chemical Examiner, U P, to his former post as Civil Surgeon of Mirzapur.

LIEUTENANT C E PALMER I M S, is posted to Allahabad, and Captain N S Sodhi, I M S to Cawnpur on plague duty.

CAPTAIN J B CHRISTIAN, I M S, Captain V B Nesfield, F R C S, I M S, and Lieutenant D C V Fitzgerald, I M S, join the E B & A Province as Civil Surgeons.

CAPTAIN CHRISTIAN was posted to Tippera, Captain Neshold to Barisal, and Lieutenant Fitzgerald to Sylhet.

MAJOR B H DEORF I M S was granted five weeks' privilege leave and Assistant Surgeon S C Mitta acted as Civil Surgeon of Hazaribagh.

PRIVILEGE AND COMBINED LEAVE.—With the approval of the Right Hon'ble the Secretary of State for India the Government of India have been pleased to permit officers under the Indian Military Leave Rules to retire, resign, or to be transferred to the Home Establishment or to Colonial employment while on privilege or combined leave without the same being converted into ordinary leave and the consequent retrenchment of allowances in respect to the period of privilege leave.

We presume that this important privilege also applies to Indian Medical Service men who have been in Civil employment till retirement.

INDIAN SUBORDINATE MEDICAL DEPARTMENT (HOSPITAL ASSISTANTS BRANCH)

Medals inscribed "For Meritorious Service," with annuity, have been awarded to

No 1194 first class Hospital Assistant C Sadayya Mudali, Madras Establishment, *vice* No 526 first class Hospital Assistant Maya Das Bengal Establishment, promoted, with effect from 1st July 1907.

No 1196 first class Hospital Assistant P M Patrudu, Madras Establishment, *vice* No 533 first class Hospital Assistant Tara Choud, Bengal Establishment, transferred to the pension establishment, with effect from 1st September 1907.

No 1200 first class Hospital Assistant C Mungesu Mudali, Madras Establishment, *vice* No 535 1st class Hospital Assistant Surjan Singh, Rai Sahib, Bengal Establishment, promoted with effect from 16th September 1907.

No 1206 first class Hospital Assistant J E D'Oroz, Madras Establishment, *vice* No 1194 first class Hospital Assistant C Sadayya Mudali, Madras Establishment, promoted, with effect from the 29th November 1907.

No 1211 first class Hospital Assistant Sayid Sulaiman, Madras Establishment *vice* No 536 first class Hospital Assistant Mohammad Ismail Khan, Bengal Establishment, promoted, with effect from 29th December 1907.

No 649 first class Hospital Assistant Faizullah, Bengal Establishment, *vice* No 534 first class Hospital Assistant Niyiz Hossain Bengal Establishment, promoted, with effect from 14th January 1908.

No 593 first class Hospital Assistant Sundar Singh, Bengal Establishment *vice* No 136 first class Hospital Assistant Yehuda Daniel, Bombay Establishment, promoted, with effect from 1st April 1908.

MAJOR R H ELLIOT, F R C S I M S, who was due out in Madras from furlough on 26th October, has applied for an extension of leave.

MAJOR C H L PALK, I M S, is due out from two years' leave on 6th January 1900.

CAPTAIN H ST J FRASER, I M S, was due out from one year's furlough on 24th September 1908.

SURGEON GENERAL JOHN PHILIP GREANY, M D, I M S, Bombay, has been permitted by the Secretary of State for India to retire from the service, subject to His Majesty's approval, with effect from the 1st October 1908.

THE FOLLOWING LIEUTENANTS ARE PROMOTED TO BE CAPTAINS, I M S

Dated 1st September 1908.

Cairwallader Edwards Palmer, M B
Carl Henry Reinhold
Bodenick Edward Middleton Newland
Lewis Albert Hodgkinson Lack
Kenneth William Mackenzie
Narendra Singh Sodhi
William Jackson Powell, M B
William Cowan Gray

CAPTAIN W S PATTON, M B I M S, Officiating Director of the King Institute of Preventive Medicine, Madras, is granted privilege leave for one month and twenty five days, with furlough on medical certificate for six months in continuation, with effect from the 24th August 1908.

THE following is the notification in the *Gazette of India* of the new pension —

"With reference to paragraph 7 of Military Department Notification No 1047, dated the 24th October 1903, in which revised rates of pension were prescribed for officers of the Indian Medical Service, it is hereby notified that the Right Hon'ble the Secretary of State for India has sanctioned a rate of pension at £600 per annum for officers who have completed 27½ years' service for pension. This new rate of pension will have effect from the 2nd August 1908."

MAJOR R G TURNER, I M S, Civil Surgeon, Jhansi, was granted one month's privilege leave from date of relief.

ON 30th August 1908 Lieutenant W D H Stevenson, I M S, took over charge of the civil medical duties of Dora Ismail Khan District.

CAPTAIN A K LAUDIE, I M S, District Plague Medical Officer, Gujranwala, was transferred to Karnal, in the same capacity, where he assumed charge of his duties on the forenoon of the 21st August 1908, relieving Assistant Surgeon Maya Das.

LIEUTENANT E J C McDONALD, I M S, was transferred to Sialkot and assumed charge of his duties there as District Plague Medical Officer, on the forenoon of the 6th August 1908 relieving Assistant-Surgeon Feioz nd din Mahroof.

ON return from the privilege leave of absence granted to him in notification No 676, dated the 15th of August 1908, Captain M Cory, I M S, Civil Surgeon, resumed charge of his duties at Sialkot on the forenoon of the 1st of September 1908, relieving Assistant Surgeon Feioz nd din Mahroof, of the additional charge.

CAPTAIN G FOWLER, I M S, is posted as Civil Surgeon of Wardha, C P.

MILITARY ASSISTANT SURGEON J DOYLE is posted to the medical charges of the Ellichpin Sub division of the Amraoti District.

CAPTAIN C H BRODRIBB, I M S acted as Civil Surgeon of Jhansi in addition to his military duties during the absence on leave of Major R G Turner, I M S.

MILITARY ASSISTANT SURGEON W J CORRIGAN, I S M D, has been appointed Deputy Superintendent of the Central Asylum, Agri.

LIEUTENANT W D WRIGHT, I M S, assumed charge of the plague work at Cawnpur on 19th September 1908.

THE following correspondence is of interest —

No 916, dated Simla, the 8th August 1908

"From P W Monie, Esq, Under Secretary to the Government of India, Home Department,

To—The Secretary to the Government of Bengal, Municipal (Medical) Department.

In continuation of the Home Department letter No 248, dated the 20th February 1908, I am directed to forward a copy of the letter noted on the margin, regarding rule 11 of the regulations for the grant of study leave to officers of the Indian Medical Service.

No 4886G, dated Simla, the 29th July 1908

From—Major W H F Basevi, Offg Deputy Secretary to the Government of India, Department of Military Supply, To—The Director General, Indian Medical Service.

With reference to paragraph 11 of the regulations regarding the grant of study leave to officers of the Indian Medical Service as contained in Department of Military Supply Notification No 16, dated the 15th March 1907, I am directed to say that, with the approval of the Right Hon'ble the Secretary of State for India, the Government of India have decided that the amount of study leave carrying furlough pay at Civil rates should be calculated upon the period of service spent under civil rules, or in other words, upon the same period of service as qualifies for ordinary furlough carrying pay at Civil rates."

His Excellency the Governor of Bombay in Council is pleased to appoint Assistant Surgeon W E Kirkpatrick to act as Civil Surgeon, Karwar, *vice* Captain G McPherson, M A, M B, C M, I M S, pending further orders.

His Excellency the Governor of Bombay in Council is pleased to make the following appointments —

Major W S P Ricketts, M B, I M S, to act as Post Surgeon, Aden, and in medical charge, European General Hospital, Aden, pending further orders.

Lieutenant Colonel R J Baker, M A, M D, I M S, to act as Deputy Sanitary Commissioner, Sind Registration District, in addition to his own duties, pending further orders.

His Excellency the Governor of Bombay in Council is pleased to appoint Lieutenant A G Coullie, M B, I M S, to act as Civil Surgeon, Satara, in addition to his Military duty, *vice* Major J B Jamieson, M B, I M S, pending further orders.

His Excellency the Governor of Bombay in Council is pleased to direct with reference to Government Notification No 11043, dated 12th November 1907 that Captain G McPherson, M A, M B, C M, I M S should resume the appointment of Superintendent of Matheran and *ex officio* Assistant Collector in the Kolaba District from the commencement of the season after the rains.

MAJOR W S P RICKETTS, M B, I M S, and Lieutenant Colonel R J Baker, M A, M D, I M S, respectively delivered over and received charge of the office of the Deputy Sanitary Commissioner, Sind Registration District, on 10th September 1908, after office hours.

THERAPEUTIC NOTES AND PREPARATIONS

EXTRACT FROM ARMY MEDICAL DEPARTMENT REPORT FOR THE YEAR 1907 VOL XLIX PAGE 135

Mosquito Destruction—Experiments were made to find a cheap substitute for kerosene to destroy mosquito larvae in drain gratings and small collections of water. It was found that JEYES' FLUID would do the work of ten times the amount of kerosene, moreover, kerosene evaporated within three days in the hot weather, whereas Jeyes' Fluid remained effective until the rains commenced and washed it away. Both the fluids are the same price by bulk, and kerosene is used for the destruction of larvae is apt to be put to other uses in barracks.

Notice

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs Thacker, Spink & Co, Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs Thacker, Spink & Co, Calcutta.

Annual Subscriptions to "*The Indian Medical Gazette*," Rs 12, including postage, in India Rs 14, including postage, abroad.

BOOKS, REPORTS, &c, RECEIVED —

Analytical Index to Vols I to X of Medical Review.
Synopsis of Surgery E W H Groves, (Price 7s 6d) John Wright & Sons, Ltd.
Military Hygiene Lt Col Firth, R A M C (Price 3s 6d) J & A Churchill.
Legal Responsibility of the Drunkard N Barnett (Price 2s 6d) Bailliere, Tindall & Cox.
Calcutta Health Officers Report (1907)
Vaccination Report, Bengal
Hong Kong Health Report
King Institute Report (Vaccine Section)
Vaccination Report E B & A
Hospitals Report, U P
King Institute Report
Green's Encyclopedia & Dictionary, Vol IX.

LETTERS, COMMUNICATIONS, &c, RECEIVED FROM —

The Hon'ble Colonel R D Murray, I M S, Delhi Tal, Capt Megaw, I M S, London. Capt McCarrison, I M S, London, Capt Rait I M S, Pune, Major Henry Smith I M S, London. Lt Col H Herbert I M S, Nottingham. Major G Lamb, I M S, Kasauli. Dr Badcock Madras. Lt Col W E Jennings I M S, Bombay, Lt Col Burke, I M S, Bombay. Lt Col Crawford, I M S, Hughli. Lt Col Pissani, I M S, Moradabad, Lt A Napier, I M S, Lt Hobbert, I M S, Capt J Hay Burgess, I M S, Dr Lloyd Paterson, Assam. Capt D McGay, I M S, Calcutta, Capt Holdich Leicester, I M S, Calcutta.

Original Articles.

OBSERVATIONS ON ENDEMIC CRETINISM
IN THE CHITRAL AND GILGIT*
VALLEYS

By R. McCARRISON, M.B., B.Ch.,

CAPTAIN, I.M.S.,

Agency Surgeon in Gilgit

THE present study of Endemic Cretinism is based on an analysis of 203 cases of the disease, comprising the total cretinous population of the Gilgit and Mastuj districts. These districts extend over an area of about 500 miles of Himalayan country.

The cases have been collected by a house to house examination of almost every goitrous village in the district, so that few examples of the disease have escaped my observation.

At the outset I should, perhaps, direct attention to the fact that the observations to be detailed, and the conclusions to be drawn, refer only to cretinism as prevailing among the Chitrali and Gilgiti races. It will be found necessary when applying these results elsewhere, to take into consideration such factors as racial differences, habits of life, climatic conditions, etc., which are of importance in determining the prevalence of the disease (1).

For convenience of discussion I propose to divide my subject into the following six sections —

I The incidence of cretinism and its relationship to the incidence of goitre

II Goitre in the individual and its relationship to cretinism

III Goitre in the mother and its relationship to cretinism

IV Debilitating factors and their influence on the mother in producing cretinism

V Types of the disease with associated symptoms

VI Conclusions

I THE INCIDENCE OF CRETINISM AND ITS
RELATIONSHIP TO THE INCIDENCE OF GOITRE

As is well known, endemic goitre, cretinism and deaf-mutism, are associated conditions. In this respect Gilgit and Chitral provide no exception to the rule.

There are certain facts, however, with regard to the association, which are deserving of comment,—

(a) Where goitre is commencing in epidemic form, as for example in Nagai, or among troops introduced into infected areas, the younger members of the community are the first to suffer. Such an epidemic, however, produces no cases of cretinism.

(b) In Chitral, on the other hand, where a relatively high percentage of children are goitrous, cretinism does occur, but is not common. I have been unable to trace a single instance, in which goitre in the child has given rise to cretinism.

Cretinism does not make its appearance in a goitrous family until the second or even the third generation.

(c) Now, in Gilgit, children suffer much less from goitre than do the children of Chitral, but they suffer much more from cretinism. Goitre is said to be of comparatively recent introduction into Chitral. In Gilgit, it has prevailed for centuries, and in districts where goitre is more prevalent among the adult population, cretinism is more common and of a graver type.

(d) Cretinism shows a marked tendency to occur in certain families. It is common to find several children in the same family, cretinous. I have met with instances where every child in the family has been a cretin.

While, therefore, cretinism is found to be intimately associated with goitre, the degree of this association is determined by the age of the endemic of goitre and by the extent to which the disease prevails among the adult population.

II GOITRE IN THE INDIVIDUAL AND ITS
RELATIONSHIP TO CRETINISM

Just as endemic goitre is rarely found to produce myxœdema in the adult, so this condition is rarely a cause of cretinism in the child. Indeed, I have never met with such a case. This fact is opposed to the present day view that 75% of cretinism in goitrous localities is due to goitre in the individual (3).

Facts bearing on this point have already been dealt with in the preceding section, the following further observations remain to be recorded —

(1) There are in the present series of 203 cases, 88, or 44% in which there is an accompanying goitre. With the exception of two cases, in which the goitre was congenital, the history shows that the thyroid enlargement was subsequent and not prior to the appearance of the cretinic symptoms. It is possible that in some instances these histories may be incorrect, the accompanying chart, however, should establish this general truth. The black line shows the number of cretins, the red line the number of goitrous cretins in the district at each year of age up to and over twenty years. From the chart it will be observed that the older a cretin is, the more likely he is to have a goitre. While only 17% of all cretins under the age of ten years are goitrous, no less than 70% over that age have an accompanying goitre.

(2) I can find little support for the view that goitrous cretins are, as a rule, less swollen and their condition relatively less grave than that of those without a goitre. Of the 88 goitrous cretins 20% are noted as being much swollen; while in the non-goitrous cases 25% are similarly

* Read at Royal Society of Medicine, London

much swollen. So far as my experience goes, I find that the presence or absence of a goitre is a matter of very little importance to the child's myxedematous condition. The mental defect is, however, frequently greater, and nervous symptoms are more commonly present in these without a goitre. It is to be remembered that the so-called "goitre" is in reality made up, in the vast majority, of one or more adenomata in a functionally inactive or imperfectly active organ. The presence of such a goitre would not be beneficial to the child. There are, however, some few cases, in which the development of a goitre would appear to have been beneficial. Mr James Berry, in his work on the thyroid gland, has instanced a case where the general body swelling diminished as the goitre enlarged. I have met with two similar cases (Nos 5 and 159).

I have noted the presence of "fatty tumours" in 24% of my cases.

(3) Cretins are much more commonly goitrous than are healthy children.

III GOITRE IN THE MOTHER AND ITS RELATIONSHIP TO CRETINISM

Our conception of endemic goitre has undergone some change of late years. The disease has hitherto been regarded as non-infectious. My investigations, however, have convinced me of its infectious nature. This view, although perhaps not yet sufficiently proven to demonstration, nevertheless provides the better explanation of its general phenomena, and of its sequel endemic cretinism.

There are, as is well known, certain infectious diseases of the mother such as tuberculosis, erysipelas, acute rheumatism, malaria, and influenza, which are capable of producing pathological effects on the child's thyroid gland. It is believed that the toxins produced by the organisms of these diseases circulate in the foetus and give rise to the morbid condition. It is to these toxins that cases of sporadic cretinism, in which there is no associated goitre, are attributed. Although infectious agencies have an undoubted influence in the production of endemic cretinism, this action is not limited as has been supposed, to non-goitrous cases of the disease. Of all infectious diseases which impair the unborn child's thyroid mechanism, the most important is endemic goitre. It is that disease which is beyond all others most frequently associated with cretinism.

Now in almost every case of cretinism goitre is present in one or both parents. It is present in the mother in 86% of my cases, in the father in 40%. The presence of a goitre was not noted in the mother in 28 cases. In 20 of these the mother herself was not seen or was dead. If these are excluded as uncertain, goitre is found to have been absent in the mother in only eight cases or 4%. While, therefore, cretinism can occur in the child of a woman free from goitre, it

must be established as a rule that in endemic localities, goitre in the mother is one of the most essential conditions for the development of cretinism in the child.

Maternal goitres are in over 80% of cases degenerated, the seat of adenomatous or of cystic change. Such an organ cannot be regarded as possessing the same potential powers of functional activity as a normal gland. The investigations of Baumann have shown that a goitre contains less thyroïdin than a normal gland, thus demonstrating the functional deficiency of the goitrous organ. Despite this defect the thyroid mechanism of the majority of goitrous women is capable of meeting the additional demands which pregnancy or other accidental circumstances may make upon it. There is, however, a minority in which this is not the case, and it is this minority which constitutes the mothers of cretins.

The experiments of Halstead and Edmunds on animals have shown the effect of an impaired action of the thyroid mechanism of the mother on the offspring. They afford, I think, an explanation of the train of events which gives rise to cretinism especially when they are considered in connection with the infectious origin of goitre. In describing these experiments I quote from Edmunds's work on the subject. "Halstead found in the puppies of a bitch from which the thyroid gland had been removed, and which had been nursed by a dog that had also in part been deprived of its thyroid gland, that the thyroid lobes in the puppies were twenty times larger than those of normal puppies." Edmunds repeated this experiment and obtained a similar result. He found that the changes observed on microscopical examination were those of "compensatory hypertrophy" and "were presumably due to an attempt to compensate for the absence of thyroid in the mother." The function of the thyroid mechanism is to neutralize toxins produced in the ordinary course of metabolism. In the case of the thyroidless bitch of this experiment there were more toxins circulating in the blood than her impaired thyroid mechanism could deal with. These toxins called forth a response on the part of the puppies' gland and determined the resultant congenital goitre.

Dr Richardson in his work on the Thyroid Gland summarises that the reverse of this experiment would probably occur and would account for a certain percentage of the cases. He says "should the mother have an excess of thyroid secretion, the gland in the young would not develop and consequently the child would show cretinic symptoms after weaning." "The occurrence of a cretinic condition without goitre where goitre is endemic, suggests that the parenchymatous increase of the maternal gland, in conjunction with the normal hypersecretion of pregnancy, prevents the development of the fetal gland." I am of opinion that it is

OBSERVATIONS ON ENDEMIC CRETINISM IN THE CHITRAL AND GILGIT VALLEYS

BY CAPT R MCCARRISON, MB, BCH, IMS,
Agency Surgeon in Gilgit

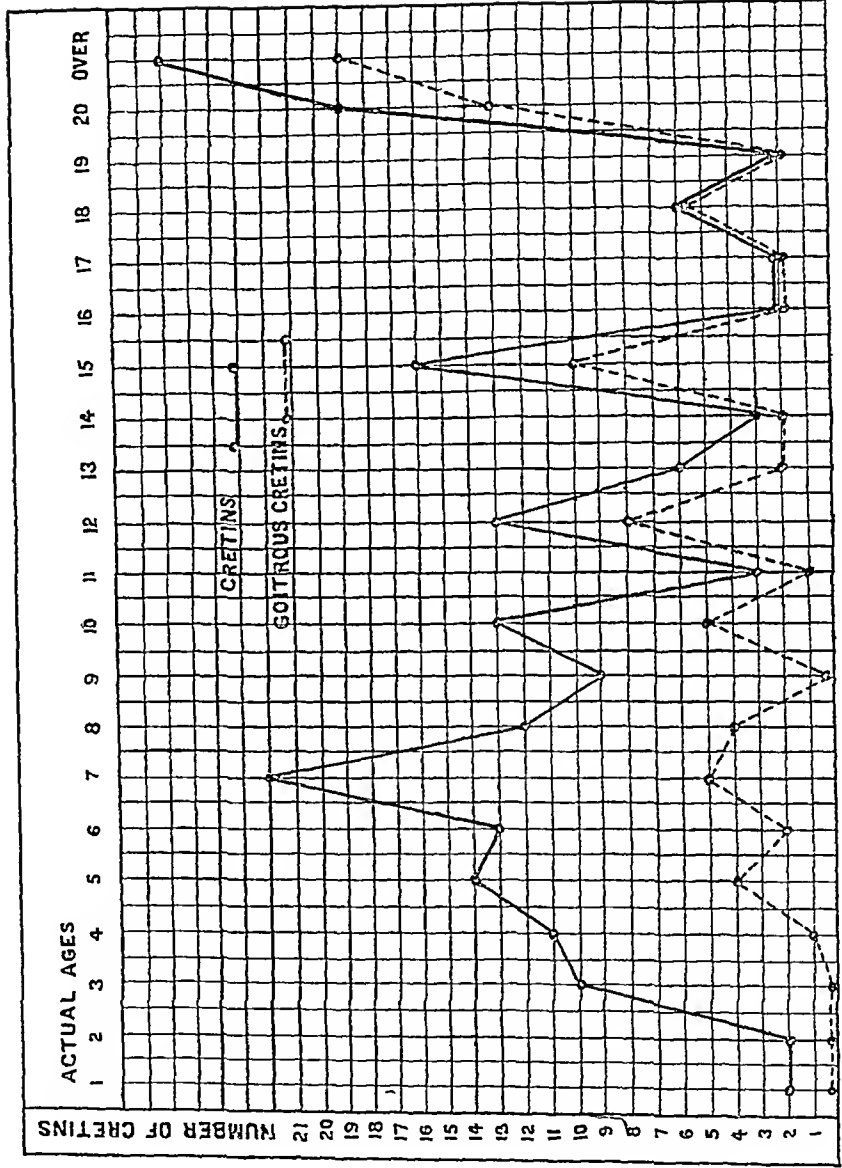


CHART SHOWING ACTUAL NUMBER OF CRETINS AT EACH YEAR OF AGE, ALSO THE NUMBER OF GOITROUS CRETINS AT THESE AGES

unnecessary to assume a reverse picture to that of the experiment quoted, believing as I do that its results are applicable directly to the goitrous pregnant woman. That in such a woman there is no excess of unutilized secretion is shown by the fact that the administration of the gland extract causes a reduction in size of the hypertrophied organ in both pregnancy and goitre. It appears to me that it is not the excess of secretion but the greater excess of demand that is of importance. It is the failure to meet all demands which constitutes a temporary inefficiency of these glands, and places the woman in a position identical with the partially thyroidless animal of the experiment. The goitrous mothers of cretinous children very commonly exhibit in their own persons signs of thyroid insufficiency during pregnancy, of these signs perhaps the most noticeable is that of tetany.

There is then a certain minority among goitrous pregnant women in which the thyroid mechanism is deficient. These are the mothers of cretins. The results of the experiment are applicable to them, but with this difference, that whereas the partially thyroidless bitch, under non-goitrous conditions, gave birth to offspring congenitally goitrous, the partially thyroidless woman, under continuous exposure to goitrous influences, gives birth to cretins.

The children of Gilgit, as I have already stated, are relatively immune to goitre. Succeeding generations have under continuous goitrous influences developed this degree of natural resistance to it. That children in other localities are not naturally immune to goitre, but are indeed more susceptible to it than adults, is shown by the cases of the epidemic in Nagai (1). This immunity wears itself out and from puberty onwards the disease becomes more and more frequent, until almost half the population suffers from it during the later years of life.

I regard the immunity as due to the minimal action of the toxic agent of goitre on the developing foetal organism, which gives rise in the child to considerable cumulative powers of resistance. But where, owing to insufficiency of the maternal thyroid, toxic agencies are allowed free play, this action on the developing foetal organ is continuous and excessive resulting in compensatory hypertrophy, or atrophy of whole or part of the thyroid mechanism. I believe that just in so far as the mother's thyroid potentiality possesses the inherent power of response to every demand, so far may we expect her child to be born temporarily immune to goitre, with congenital goitre or with cretinism, all of these I regard as being but stages in the same process and the evidence of the minimal, medial, or maximal action of the toxic agents on the unborn child's thyroid mechanism. The following cases may be quoted in support of the views which have

been expressed, others will be found in the appendix —

No 100 The mother is partially myxœdematous (Fig 1). She has a small goitre and suffers from tetany. These attacks are worse during pregnancy and they are more frequent



Fig 1

during the spring months, when she may have as many as two or three during one month. There is no unconsciousness during them. She has always been myxœdematous, but believes that she is better than she used to be. She gives a very goitrous and myxœdematous family history. She has had eight children before the present child. They were all, according to her "born cretins." All were very swollen from birth, and all died before the age of three years. The child shown in the photograph is two years old. It is remarkably swollen.* The parents in this case are well-to-do.

Nos 190 and 191 Family very poor. Mother has a large tumorous goitre and suffers from tetany during pregnancy, she is coarse skinned and somewhat swollen. Her son, aged twenty-four (No 190), the right-hand figure as seen by the spectator is a typical nervous cretin of an extreme degree. He is a deaf-mute. Her daughter (No 191) is a typical myxœdematous cretin, aged eighteen, whose hearing and speech are defective. The mother has had nine children, of whom four are alive and all show signs of cretinism, the two youngest in lesser degree than the two eldest just described.

No 82 Mother has had three perfectly healthy children. She then developed goitre, and subsequently gave birth to the present child who became a cretin after a convulsive

* This child has improved very markedly under thyroid feeding. R M C

fit at the age of two years This cretin is twenty years of age and is very swollen

IV DEBILITATING FACTORS AND THEIR INFLUENCE ON THE MOTHER IN PRODUCING CRETINISM, CONGENITAL OR ACQUIRED

(1) *Mental disease*—The importance of mental disease in the parents of cretinous children is so slight that from an etiological point of view it may be neglected

(2) *Alcoholism*—Alcoholism, owing to the fact that the religion of the people prohibits its use, exerts no influence

(3) *Syphilis and Tuberculosis*—Syphilis and tuberculosis are rare as yet, although of late years they have become more prevalent In only one of my cases is there a history of tuberculosis (No 180)

(4) *Nervous Disease Tetany*—The only important nervous disease is tetany In a recent study of the affection, I found that of 56 mothers who are sufferers from tetany, 13 or 23% have cretinous children

(5) *Consanguinity*—Among the Syeds of Gilgit cretinism is much more common than among other classes of the community The Syeds of all Mahomedan countries, as descendants of the Prophet, are permitted to marry only in their own sect In Gilgit these Syed families are few and it is practically impossible for one of their members to marry out of a goitrous family As a consequence the stock is goitie-tainted, and the taint is accentuated by inbreeding There is a history of near marriage in 14% of my cases, and in some it is the only factor present in addition to goitie in the mother Inbreeding is, therefore, a factor of some importance

(6) *Psychic factors*—Fright, worry, mental depression and impressions received by the mother during pregnancy have great weight as determining factors There is a reliable history of one or other of these in over 40% of my cases

The following are examples—

No 142 Goitrous mother, haunted by spirit while pregnant with her first child This child is a cretin and deaf-mute Her second and third children are alive and healthy

No 157 Goitrous mother lost her first two children who were healthy, while pregnant with her third child She "remained always crying and in grief for them" Her third child was "born a cretin" and is deaf-mute The next three children are alive and healthy

No 177 Mother goitrous First two children girls, are alive and healthy Third child, a son, died during the fourth pregnancy The fourth child was "born a cretin" and is deaf-mute The fifth child was healthy, but was a girl Sixth child deaf-mute Cause stated by mother to be "grief at the death of her only son"

No 175 Mother goitrous First five children died young, the deaths of several of these

occurring during the mother's seventh pregnancy Her seventh child is a cretin and deaf-mute Her sixth child is alive and healthy

She attributed her evil fortune at the death of her children to a "spirit," which preyed greatly upon her mind during her seventh pregnancy Afterwards the priests exorcised the "spirit" Her eighth child was born normal and is alive and well

No 22 Mother goitrous Had two healthy sons then changed to a house which she believed to be haunted Her next three children are all cretins

No 85-90 Woman goitrous Husband died after she had borne to him a male child. This child fell from a roof at the age of one year and became a typical nervous cretin (Fig No 2)



FIG 2

Woman suffers from tetany and has a small tumorous goitie Second husband was a man of another village to whose house she took her cretinous son She had two sons by this husband, they are both cretins and deaf-mute and both of an extreme grade of 'nervous cretinism' There were, as is so often the case in this country, living in the same house as her second husband, two other married women Of these, one had already borne two daughters who are perfectly healthy But after the arrival of the first woman and her cretinous son, she gave birth to a child who is a "nervous" cretin and deaf-mute This child is quite helpless The other woman was not a mother at this time, but she afterwards had two children, a boy and a girl, both of whom are "nervous" cretins and deaf-mutes

It will have been observed that the type of cretinism is in all cases the same The mothers attribute the fact that they gave birth to

cretinous children to "their continually seeing the first woman's cretinous boy in the house" and "to fear that their unborn child might be like him" There is no other history of difficult labour, near marriage or illnesses during pregnancy, to account for the condition of the children in the case of the last two mothers A very exceptional fact in the case of the last mother is that she has no goitre There is in her case no other history whatever apart from the mental impression

A history of the baneful influence of "the powers of evil" is very common, and so much so that one is forced to acknowledge it as real Other frequent histories are that while in the jungle with the goats the mother was 'haunted by a fairy,' that she 'saw visions,' or that she 'saw the dead,' forms of delusional insanity which, though regarded by the mother as being the causal or exciting factor in producing cretinism in the child, may perhaps be considered as evidence of the defective functional activity of her own thyroid gland It is known that some cases of delusional insanity are due to this cause and that they may be relieved by thyroid feeding On the other hand, it is possible that the psychic influences caused the functional depression

(7) *The influences of illnesses in the mother* — As already stated, the most important factor is maternal goitre There are, however, three other diseases which, when occurring in goitrous women, appear to favour the production of cretinism These are malaria, rheumatism, and arthritis deformans Others less frequently occurring are painful eye diseases and severe abscesses about the head In 20% of all cases there is a history of illness in the mother to which the child's cretinism may reasonably be attributed

The following will serve as illustrative cases —

No 169 Mother goitrous Suffered from granular ophthalmia before her third child was born The disease resulted in her total blindness First two children healthy, the third a cretin The fourth died at the age of four but was healthy

No 177 Mother goitrous Suffered from rheumatism while she was pregnant with her second child, it is a cretin, non-goitrous and a very severe degree of the disease Her first and third children are healthy Her fourth child is dead

No 164 Mother goitrous Developed severe bronchitis before her sixth child was born, from which she still suffers severely Her first five children are normal Her sixth is a cretin

No 161 Mother had abscess of the jaw before her third child was born Her first two children are healthy Her third is a cretin Fourth and fifth children dead, but they "looked cretinous" according to her own statement

I believe that illnesses in the mother are of more frequent occurrence than I have noted, it

was not till I had collected 78 cases of the disease that a few histories of such illnesses, which had been voluntarily offered, drew my attention to them

(8) *Prolonged or difficult labour* — There is such a history in 14% of cases It is very frequently given in addition to other factors such as fright or mental distress or illnesses during pregnancy Its importance is, therefore, difficult to estimate It does, however, occur in certain cases where there is no other history, and in these it may be regarded as a debilitating factor acting on the child direct

These are the main influences which operate on the unborn child to produce cretinism They account for about 88% of the cases, and, since their action is solely through the maternal environment, they may be regarded as 'congenital'

Cretinism, however, is not always congenital, in the strictest sense of the word It may also be 'acquired' It need not, that is to say, make its appearance at birth, but may ensue upon certain external quasi-mechanical eventualities These may be divided into two classes.

(a) Nutritional (b) Accidental

(a) Nutritional factors are insufficient milk, and ill-nourishment generally, exposure to cold, defective hygiene and the like Their action, however, is slow and their influence slight They account for 2% of my cases

(b) The accidental circumstances which give rise to cretinism are three Injury, Fright, or Nervous shock, and Disease

Slightly over 10% of all cases of cretinism are to be classed as "accidental" About one half of these are goitrous, and in these also with the exception of one case, in which the goitre is congenital, the thyroid has enlarged subsequently to the onset of the cretinous symptoms The ages at which the disease has made its appearance in these cases vary between six months and ten years

It should, however, be pointed out that these "nutritional" and "accidental" factors are exciting rather than causal in their relation to the disease To account for them I believe that it is necessary to pre-suppose a congenital instability of the thyroid mechanism together with the continued action of goitre toxins

I recognise the possibility of a perfectly healthy child becoming a cretin after prolonged exposure to goitrous influences I have not, however, met with such a case These influences, of course, play a very important part in aggravating congenital cretinism, and if from any cause whatever the child's thyroid mechanism is incapable of combating them, it is reasonable to conclude that cretinoid symptoms may manifest themselves

Cretinism and Sex — In the series of cases which come under my observation, I have found a considerable preponderance of the male over the female sex The proportion is as 5 to 2.

This preponderance is still maintained among cretins who are also goitrous, but it is much less marked, the proportion being as 5 to 4. The relatively higher death-rate among female children in Gilgit is responsible in some part for the lower proportion of female cretins.

V TYPES OF THE DISEASE

There are in this district two distinct types of the disease apart from the many diverse grades of the affection which are ordinarily met with —

1 The myxœdematous type

2 The nervous type

Cases commonly present the clinical features of a combination of these

Deaf-mutism is an almost constant accompaniment of both types of the disease

With regard to the myxœdematous type of cretinism few remarks are necessary. It corresponds to that form of the affection met with in Europe, and it is described in any text-book of medicine. It is noticeable that in Gilgit it is found for the most part among the richer families, such cretins are better clothed and fed, and the conditions of life under which they live correspond more closely with those of European cretins.

Nervous Cretinism — One-third of all cases in the present series belong to this type of cretinism. Among these are included some of the very worst examples of the malady. Cretins of this type, in which the disability is more especially of the central nervous system in contradistinction to those of the myxœdematous type in whom the defect is more especially physical, are usually to be found among the poorest of the people. They are commonly quite helpless and their bodies invariably bear the scars of burns or other injuries. Their parents frequently do not take the trouble to clothe them, and they are exposed to extremes of heat and cold greater than anything met with in England. Their diet consists only of a daily cake of unleavened bread.

The general appearance of such a case is as follows (Fig 3) —

The skull is elongated, the antero-posterior diameter being long in proportion to the narrow lateral diameter. There is, as a rule, complete deaf-mutism. There is a knock-kneed spasticity of the lower limbs and the patient exhibits a complete or partial inability to stand upright. When supported on his feet he usually rests on his toes, and the knees may be close together or actually crossed, or the lower extremities may remain in a position of rigid extension. There is an increased knee-jerk and there may be marked flexion of the toes on the sole.

In those cases which are capable of walking there is a peculiar stiffness of gait and they may walk on their toes, as each foot reaches the ground there is a certain amount of 'give' at the knees and ankles, which produces a sort

of bobbing motion. There is sometimes flat foot. The upper limbs assume a position of right angled flexion, the thumb may be drawn



FIG 3

into the palm and the fingers closed over it, while the wrist is flexed. Purposeless movements of the upper limbs are common. The spastic rigidity is always worse in the lower limbs. The head may be turned slowly from side to side, and in several of the worst cases I have seen, grimaces occurred. The face is characteristically cretinoid. The degree of swelling varies considerably, it may be marked or slight and confined to the face, hands, wrist and ankles. The abdomen is, as a rule, swollen and protuberant. There is always considerable stunting of growth which may be extreme or relatively slight. The patient's mentality is much disordered. There appears to be a loss of sensibility in the skin. Puberty is delayed and the sexual organs are ill-developed. A history of convulsive seizures has in a few instances been obtained. A coarse nystagmus and internal strabismus have been noted in some cases. All degrees of this condition are seen, from a spastic paralysis of the lower limbs to a general rigidity. In short, the condition is one of cretinous idocy with associated cerebral diplegia. Photograph No 11 affords a good illustration of this class of case. The subject is twenty-four years of age, is about 3½ feet high, obviously myxœdematous and presenting practically every feature of the type which I have just detailed. His sister is a typical myxœdematous cretin and is very swollen.

I have sought in the course of my observations to find in the histories of these cases some etiological reason for dissociating the obvious cretinoid condition from the no less obvious spastic condition of the limbs. I have not been able to

find that cretins of this type are more frequent among the class of 'accidental cretins'. Noi has a history of prolonged labour, of infectious diseases, of convulsions or of any other affections of childhood afforded any grounds for the dissociation of the nervous from the cretinoid symptoms. The factors which give rise to the diplegic symptoms are *aut natal* in all cases, and I believe that it is to the congenital disability of the thyroid mechanism that this condition, like the myxœdematous type, is due. Even in those cases where there is a history of possible injury at birth I believe that this factor operates as 'an accidental' circumstance acting in the way I have described in the preceding section.

In the course of this paper I have referred to the thyroid defect in cretinism as being one of the 'thyroid mechanism,' a defect in which the parathyroids are also included in contra-distinction to the more limited defect of the thyroid proper, which is usually considered to be the morbid anatomical factor in cretinism. There can be no doubt that such a lesion exists but that it should extend to the parathyroids is not usually considered. These organs are, in the light of the most recent research on the subject, capable of functionally replacing the thyroid in the absence of the latter, though not completely so. They are, while possessing their own functional powers, an added safeguard to the organism in the case of insufficiency of the thyroid proper, while, their own insufficiency would appear, in some measure, to determine the nervous symptoms present in many cases.

The symptoms which are characteristic of 'nervous' cretinism are very similar to those which occur in animals after the complete removal of the thyroid and parathyroid glands. Indeed, as the symptoms are described by Murray, they are practically identical, a fact which affords some ground for the belief which I have expressed. I have, however, obtained results in three cases, by means of the therapeutic test of thyroid feeding, and by detailed *post-mortem* examination of the glands in a fourth, which to my mind, amount to actual proof that the nervous symptoms are due to a thyroid defect.

I have had an opportunity during the past year of treating three cases of nervous cretinism on the lines indicated. Without giving full details of these cases, it may be said that the administration of the fresh and dried extracts of sheep's thyroid has produced a marked improvement in the nervous symptoms. The spasm has disappeared, in one case the double interval strabismus (Fig 4) with the associated coarse nystagmus has almost entirely disappeared. In another, a child who could only rise to its feet by a means of support and who could only take two stumbling paces before its legs gave way, after three months treatment walked for a distance of over thirty yards without falling. This child is nine years of age. It was very much swollen, and, according to its mother, could not

speak the simplest word. She affirms that it can now say "Ma" and "Da," though it refused to do so before me. There is not the slightest



FIG 4

doubt that its hearing has very much improved, and the mother has found it possible during the last month to employ it in certain little offices such as the collecting of bits of wood. The child has grown one inch in height in three and half months, while the swelling has disappeared and the skin become smooth and soft.

The therapeutic test, then, has provided results in these three cases which amply justify my views as to the nature of the condition.

Since writing this paper I have succeeded in one case in overcoming the intense prejudice of the people against *post-mortem* examination. This case, No. 85, has been referred to in Section IV, and is one of very great interest. The disease made its appearance at the end of the first year of life, and the factor which determined its manifestation was said to be a fall from a low roof. It will be remembered that the mother suffered from signs of thyroid insufficiency. The nervous symptoms in the case (Photo No. 3) were very marked and were the most striking feature of the condition. The swelling was slight and limited to the face, wrists, and ankles, with fatty pads in the axilla. There was no very marked stunting of growth and the case might readily have been considered to be one of cerebral diplegia with pronounced mental defect. The naked eye appearances seen at the *post-mortem* examination of the child were a slight but uniform enlargement of the thyroid gland. It was very firm to the touch and was not nodular. Parathyroid glands could not be found in spite of the most careful search.

I have made at the Laboratories of the Royal Institute of Public Health with Dr. H. Dold,

pathologist to the Institute, a study of the histological appearances of the thyroid gland in the case. We found that there was a great and uniform increase of the fibrous stroma of the organ. The glandular elements were compressed. Typical vesicles were wholly absent and such as were present were almost completely obliterated. Traces only of colloid were seen scattered here and there over the sections. The appearances were those of a Struma fibrosa. We were unable to find any trace of parathyroid tissue (Micro-photograph, Fig 5)



FIG 5 Section of Thyroid Gland from a case of Nervous Cretinism

Clearly, then, in this case there existed a pronounced defect not only of the thyroid but also of the parathyroid glands. The condition of the thyroid and the deficiency of colloid material furnishes, when considered in relation to the results obtained by thyroid feeding in three similar cases, a very striking proof of the truth of the views which I have expressed.

I may have drawn attention to the similarity between nervous cretinism and cerebral diplegia, not only in symptomatology, but also in such facts as are known of its etiology. In cerebral diplegia cortical degeneration is, it is believed, due to the action of some toxic agent. In cretinism, the nervous symptoms are attributed, in my view, to toxins, which owing to a congenital insufficiency of the thyroid mechanism are no longer restrained in their action. In these cases of cerebral diplegia in which the etiology is obscure and in which the condition cannot reasonably be attributed to direct injury at birth, thyroid feeding may prove of benefit.

Deaf-mutism as associated with cretinism — In no less than 87% of all cases there is an associated degree of deaf-mutism. In the majority of cases it is complete, in the minority it is partial. In the nervous type it is almost always

complete, less frequently so in the myxedematons. The defect of speech may be caused in part by a swollen condition of the tongue, but it is mainly dependent on imperfect development of the higher brain centres, due I believe as in the case of the other nervous symptoms, to the unrestrained action of toxins. It is more frequently present in males than in females. The following cases are of interest as showing the relationship of goitre and cretinism to deaf-mutism —

No 5. The hearing and speech are said to have improved after the appearance of a goitre at the age of twelve years.

No 137. The patient could hear and speak normally before the age of five years, when he fell from a roof and became a cretin and deaf-mute.

No 149. The patient could hear and speak before the age of seven years when—after a fright—he became a cretin of the nervous type and quite deaf and dumb.

No 159. The patient's hearing and speech are improving slowly since the development of a goitre at the age of thirty-five years. I have referred to the case of nervous cretinism under treatment where the hearing has undoubtedly improved and the child is said to be beginning to talk after three and half months' thyroid feeding.

VI CONCLUSIONS

(1) The degree to which cretinism is associated with goitre is determined by the age of the endemic, and varies directly with the extent to which the latter disease prevails among the adult population.

(2) Cretinism is rarely, if ever, due to the development of a goitre in the individual. The thyroid enlargement, is, or may be, an effect, it is not the cause of the disease.

(3) Defective thyroid functionation in the mother is the essential factor in the production of cretinism.

(4) Cretinism is due to the action of toxic agents, notably that of endemic goitre, on the developing thyroid of the unborn child.

(5) The thyroid defect is congenital, but it may remain latent pending its manifestation through the impulse of some accidental circumstance.

(6) The defect in cretinism is one of the whole thyroid mechanism, of the parathyroids as well as of the thyroid gland. The diversity of symptoms is due to the extent to which the defect bears on the whole or part of that mechanism.

I should, perhaps, once more emphasize the fact that the conclusions have been drawn from data afforded solely by the Gilgit and Chitral districts.

I desire to express my indebtedness to my assistant, Sudai Sahib Kehai Singh, whose untiring help and whose knowledge of the

X-RAYS AS AN AID TO DIAGNOSIS IN SOME COMMON SURGICAL CONDITIONS

By CAPT. F. POWELL CONNOR, FRCS, IMS

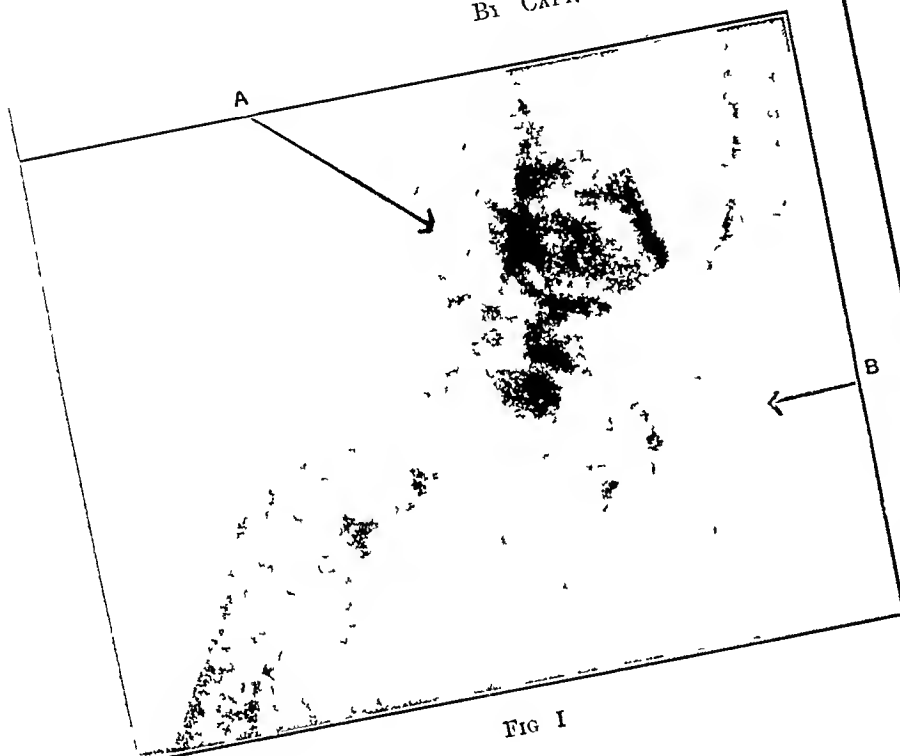


FIG I

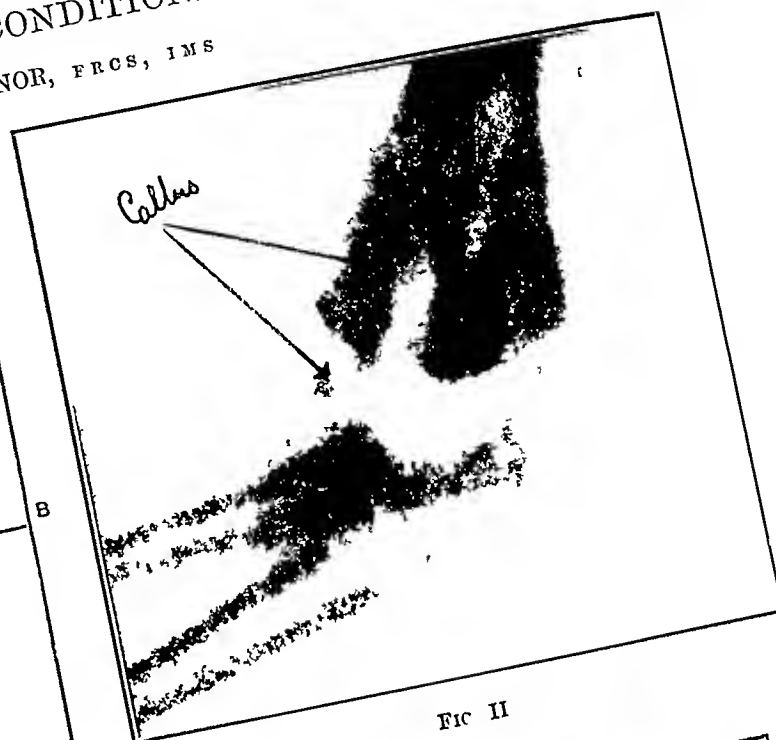


FIG II

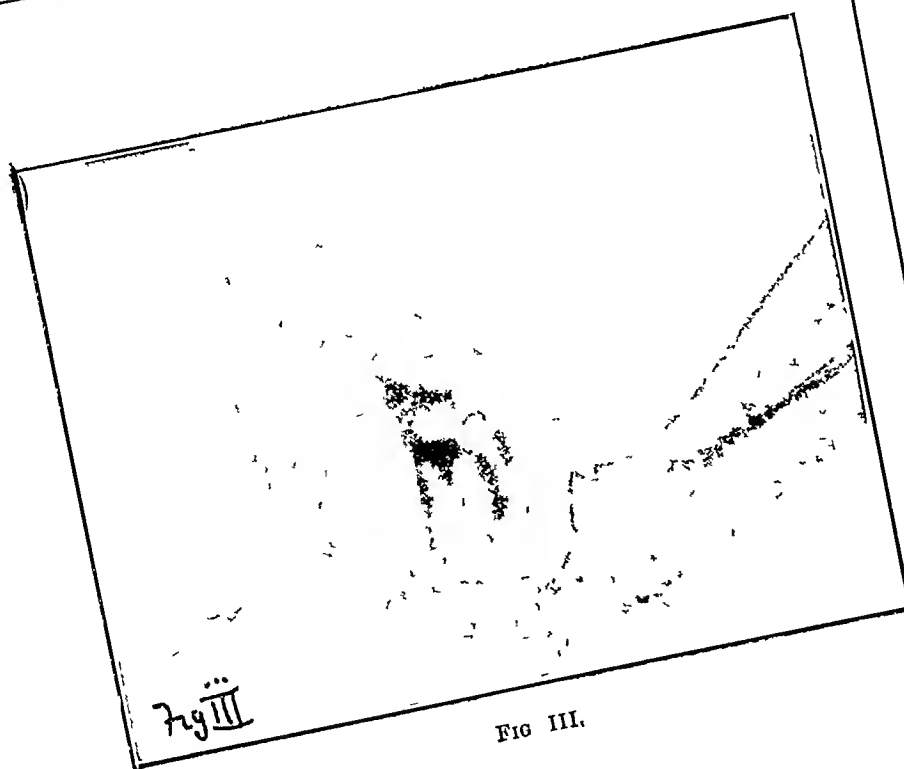


FIG III.

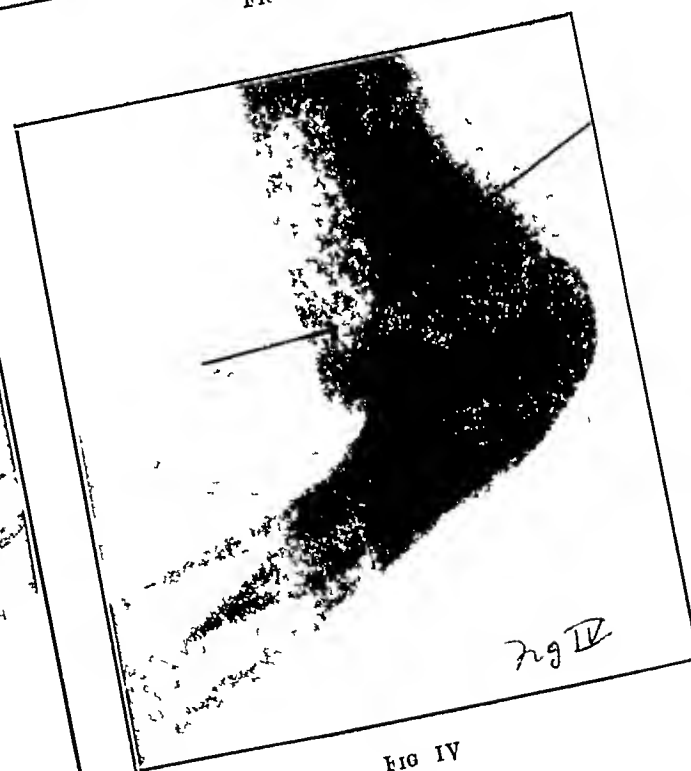


FIG IV

Chitrali and Gilgiti languages rendered possible the accumulation of material on which this paper is based

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X-RAYS AS AN AID TO DIAGNOSIS IN SOME COMMON SURGICAL CONDITIONS *

By F POWELL CONNOR, I R C S,

CAPT, I M S

THE Roentgen-Rays are now employed in such a variety of ways in almost every branch of medicine, that all that it will be possible to do here is to touch upon a fringe of the subject, viz to demonstrate their great utility in a few important surgical conditions

Methods of Examination—The most important of these are

(i) Fluoroscopy-direct, stereoscopic or localizing

(ii) Skiagraphy-direct (in different positions), stereoscopic, and localizing by some such methods as Mackenzie Davidson's Cross-Thread Localizer

These are the two chief methods utilized for most conditions, especially the ordinary bone lesions. In the case of hollow viscera various ingenious methods have been introduced to facilitate examination

(iii) The introduction of a metallic bougie (bladder, oesophagus, etc)

(iv) The bismuth method, which, as I shall show, is of great value in abdominal investigations

(v) Introduction of an air or gas (stomach), or of oxygen (bladder, joints, etc)

In the case of foreign bodies the stereoscopic method is particularly valuable

Besides bone lesions, growths in the chest and abdomen, calculi, whether vesical, renal or appendicular, abscesses, such as hepatic, psoas, etc, are a few of the surgical conditions that can be readily examined by Roentgen methods

Bone Lesions—I will deal with two common fractures to illustrate the extreme value of the X-rays in such conditions. But, it is as well only to regard this method of examination as

an aid to other clinical methods, or as an High Court of appeal, rather than an every-day clinical method. It must also be remembered that the eye gains a great deal by practice, and it is not everyone who can tell what constitutes a slight abnormality at first sight

To take a well-known condition first, Colles' fracture, examination by Roentgen methods has very much upset the old stereotyped description found till recently in text-books. Morton* has examined 170 cases diagnosed as Colles' fracture, and his results are most interesting. Injury to the styloid process of the ulna, for instance, was supposed to be a rare condition in former days, and yet it was found to exist in about one-half of these cases. Again, the line of fracture was said to be, as often as not, over 1 inch from the carpal border, while in this series only two were over 1 inch from the corpus, and in 72% of the cases it was only $\frac{1}{2}$ inch or less. The wrist-joint was involved in only 25 cases, and the displacement of the lower fragment was found to be backwards twice as often as all the other displacements put together. Impaction occurred in 57 per cent of the cases. Fig I represents a skiagram of a severe Colles with much displacements of the lower fragment (A), and fracture of the ulnar styloid (B)

Supra-condyloid fracture of the humerus is another very common fracture, which I should like to touch upon. It is described in all surgical books, but to my mind very badly in most, and much too little stress is laid upon it. To me it seems to deserve as much attention at the elbow as Colles' fracture receives at the wrist. It is a fracture involving the humerus just above the condyles, and sometimes passing through the epiphyseal line when present, but generally just above that level. I have seen it so often among the out patients at the Medical College Hospital, that I have begun to collect cases to see what proportion of all cases of fracture at the elbow belong to this class

The fracture is generally caused by a fall on a partly flexed arm, much as in the case of a Colles. It is frequently due to quite a slight fall, particularly in children, but is not by any means always through the epiphyseal line. Unfortunately most of these cases come to the hospital some days or weeks after the accident. One reason for this is perhaps that the majority occur in the mofussil, and another is that most of these cases are diagnosed as bad sprains at first, and such cases are not uncommon. Though the fracture is obvious in the skiagram, clinically it is far from apparent. Being incomplete, and with little displacement—

(a) The length of the humerus is not appreciably affected

(b) No crepitus can be obtained

(c) And examination is rendered very difficult owing to the condition being an extremely

* Read before the Medical Section of the Asiatic Society of Bengal

* Lancet, March 16, 1907.

painful one, and owing to the fact that there is always considerable swelling in front of the elbow joint.

Yet such a fracture, though amounting to little more than a crack in the bone, may lead to considerable stiffness and right-angle limitation of movement, if not diagnosed and treated correctly in the first instance. Such a case is illustrated in Fig II, where excessive callus formation has produced considerable loss of movement in the joint.

When there is more displacement upwards and backwards of the lower fragment—as shown in Fig III—some shortening must occur, but even then the condition is often not diagnosed owing to the marked pain on movement and anterior swelling. The latter is a very characteristic feature of these fractures and distinguishes them from fractures involving the elbow joint, in which there is, in addition, a bulging on both sides of the olecranon process. The swelling is due to the effusion of blood and serum, caused chiefly by the laceration of the Brachialis Anticus by the lower end of the upper fragment, and also by the fracture itself, but it is also due to the presence of the lower end of the upper fragment in front of either the lower fragment or in front of the elbow joint (*vide* Fig IV). The intense pain and tenderness are the result of pressure brought to bear on the nerves and other structures in front of the elbow joint by the lower end of the upper fragment, and are also due to the amount of the effusion which increases the tension of the part.

It is interesting with the help of skiagrams to investigate the causes which produce such uniformity both as regards the position of the fracture, and the relative position of the two fragments. We will first deal with the position of the fracture. This is primarily the result of a combination of two forces, the nature of the violence producing it—a fall on a partly bent arm—and the strain produced by the forcible contraction of certain muscles, chiefly the Biceps, Brachialis Anticus and Triceps. But if this was all, the bone would give way in its weakest part, namely, at the epiphyseal line (when present). As we have seen, this rarely occurs, and it is the strong capsule of the elbow joint which prevents it. Attached as it is above the radial and coronoid depressions in front, and above the olecranon fossa behind, it serves at the moment of strain to hold the diaphysis and epiphysis together, and in doing so throws the greatest strain on to the shaft of the humerus immediately above its attachments. It is here that the bone breaks, and this explains why the fracture is not, as a rule, intracapsular, nor is it through the epiphyseal line. It is this same strong capsular ligament which makes dislocation backwards of both bones of the forearm a comparatively rare event, particularly in children.

Though described as oblique, this fracture is most often a transverse one, and it is often associated with stripping up of the periosteum of the posterior surface of the shaft of the humerus by the lower fragment, in its displacement upwards and backwards (*vide* Fig III). It is rarely T-shaped, and very rarely involves the joint.

If treated inadequately or not at all, as is the case in the majority of patients who come to the Out-patient Department of the Medical College, this injury results in a typical right-angled deformity. This is very unfortunate, as the patient is unable to even raise the hand to the mouth—its primary function. This deformity is due either to the formation of excessive callus, or to the fact that the lower end of the upper fragment strikes on the base of the coronoid process as soon as the right-angled position is reached. There is a great temptation in such cases to try the effect of manipulation under an anæsthetic to overcome the stiffness. This is a great mistake, as the limited movement is not due to the formation of adhesions, and in many cases I have seen the condition has been much aggravated by well-meaning and zealous people who have not had the advantage of examining the case by Roentgen methods to ascertain the true cause of the stiff elbow joint. The only correct and adequate treatment after malunion has taken place between the two fragments, is by an open operation, and even then it is a most difficult condition to deal with. If the callus is organized and involves the capsule of the joint, excision alone can improve matters. Few will, however, consent to have such an operative procedure carried out, as they are content to remain with a strong arm, even though flexion is reduced to one-half.

My object in describing this common fracture at such length is to show that though little stress is laid on it in most surgical books, it has very constant and important characteristics, which have an intimate bearing on its treatment. The value of X-rays in elucidating the various points I have dealt with is, I think, apparent.

Diseases of Bone—Almost any disease of bone can be studied by Roentgen methods, unless microscopic in nature, and the time may come when even the microscope can be used in conjunction with the X rays.

(a) *Inflammation*—Ordinary inflammatory conditions can be studied, such as periostitis, osteitis and most important of all, necrosis. The question is constantly cropping up surgically as to whether necrosis has gone on to the formation of a sequestrum or not, and such information can often be readily obtained from a skiagram, and perhaps weeks or months of chronic suppuration thus avoided. Fig V shows a sequestrum (A) in the lower end of the radius, the result of a compound fracture.

(b) *Syphilis of bone*—In syphilis the bone lesions, though localized, have often a tendency

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By CAPT F POWELL CONNOR, FRCS, IMS

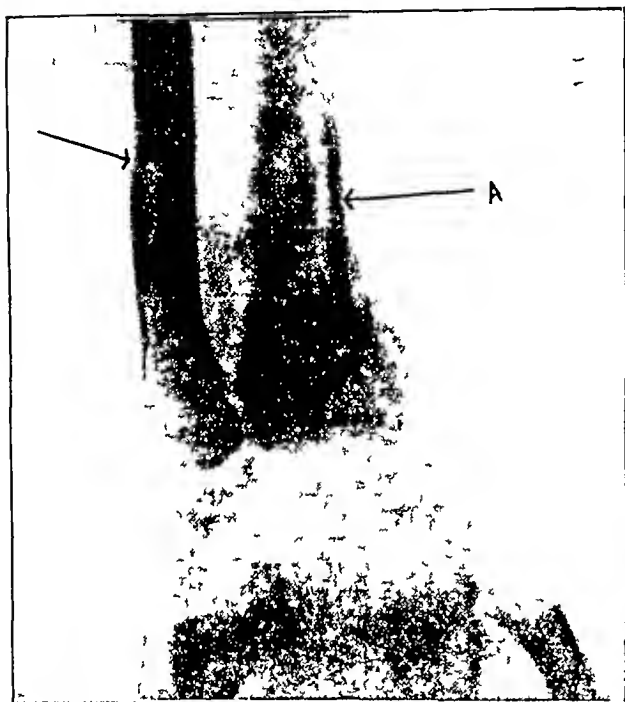


FIG V

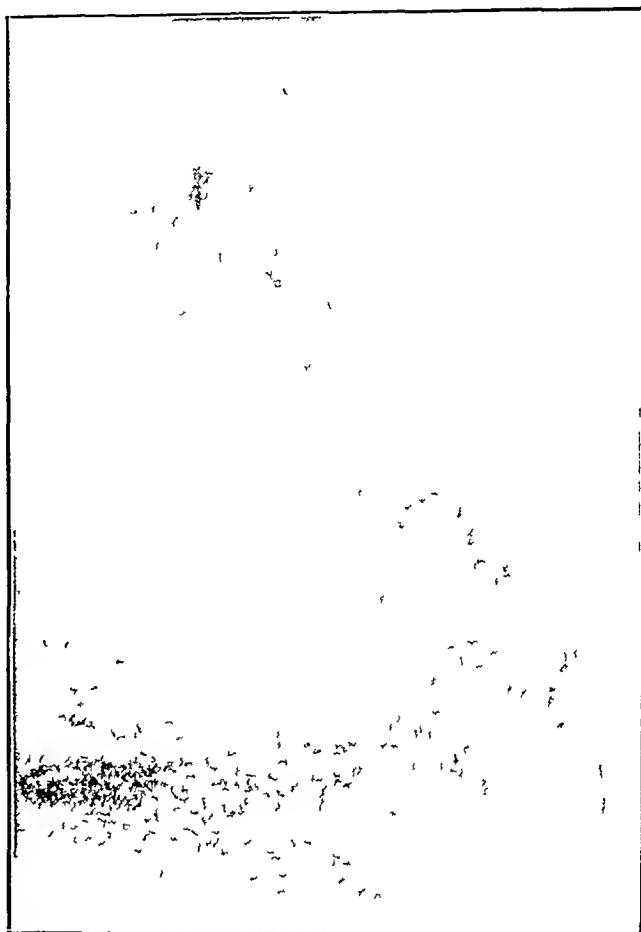


FIG VI

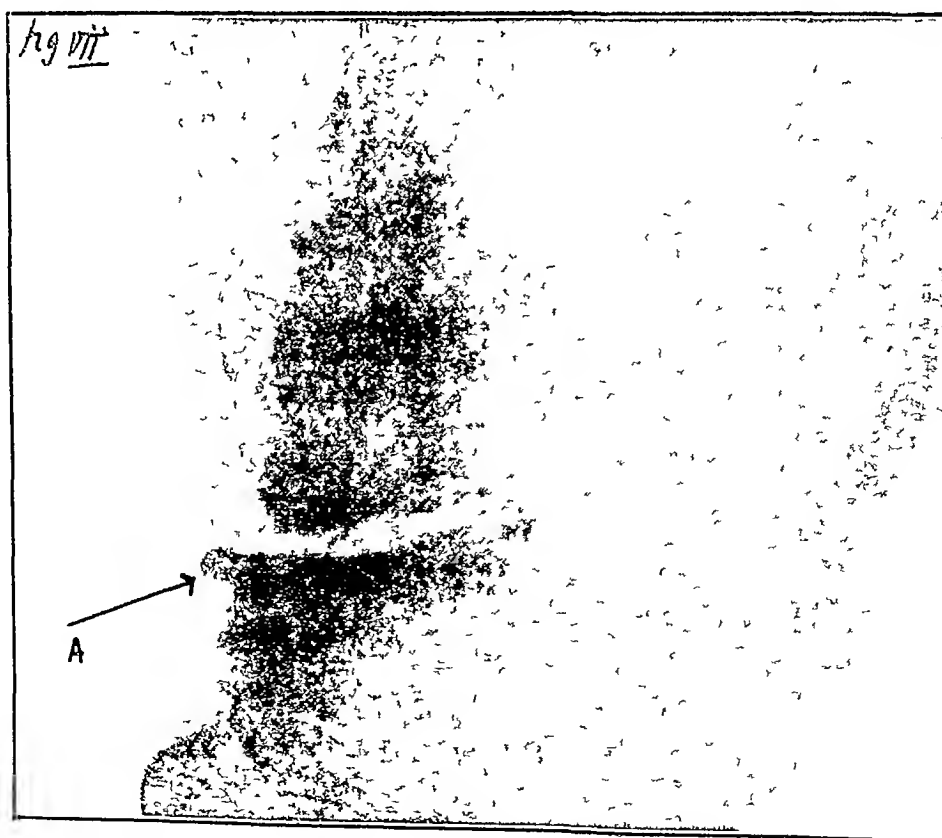


FIG VII

to be encumferential, and the periosteum is chiefly involved in the earlier stages. Beneath this there may be an osteoporosis of the bony cortex. If there is much breaking-down, as in more advanced cases, pale transparent areas are apparent. This is beautifully shown in Fig. VI. In the case of the humerus, the marked bowing and bending of the softened bone due to the play of the muscles can be well seen, while in the syphilitic ulna* the whole bone is affected by a sclerosing osteitis interrupted by translucent areas of breaking down gummatous material.

(c) *Joint Diseases*—Every variety of joint disease, unless purely synovial, can be studied by the X-rays. They are too numerous to discuss. The knee-joint shown in Fig. VII is a case of osteo-arthritis, and it illustrates the marked lipping (A) that occurs in some of these cases. The degenerative processes which occur in the cartilage and synovial membrane cannot, however, be appreciated.

The X-ray is particularly useful in diagnosing some cases of synovitis of obscure origin, such as those due to an abscess in the head of a bone and also in investigating fractures in the neighborhood of joints, etc.

Osteomata, Exostoses and other growths—Fig. VIII shows a remarkable degree of absorption at the lower end of the radius caused by an endosteal sarcoma. The ulna is slightly thinned by the pressure of the tumour, and is dislocated inwards.

Malformations, Abnormalities, etc—One has the opportunity of studying a great many of these cases in India. Supernumerary digits, hypertrophies, etc., are not uncommon. A skiagraph of a case of hexadactylia is reproduced here (Fig. IX). Comparative anatomy revels in such abnormalities, and an enthusiast would find in such a case an obvious reversion to the ichthyosaurus fore-foot. The pisiform bone is supposed to represent what was once the support of a sixth finger—may not this be an attempt to once more bring into being that vanished member? Such phylogenetic explanations have certainly a fascination and a touch of romance! In this case the supernumerary digits spring from the metacarpophalangeal joint and the condition is bilateral. Each digit consists of three phalanges, and on one side the proximal phalanx is free, articulating with the metacarpal bone by a joint common to it and the proximal phalanx of the true minimus. On the other side, however, it is united at its base with the proximal phalanx of the fifth digit, and they together form an arched articulating surface for the head of the metacarpal bone. Pryor† shows that in cases as markedly bilateral as this, the tendency to polydactylia is probably inherited, and one would

expect this to be the case. This fact could not be satisfactorily elicited in the case of this patient.

Foreign Bodies—The utility of the X-rays in the diagnosis of foreign bodies of various sorts is illustrated almost daily in hospital work, not only can the presence of such a body be readily determined by the fluorescent screen or an X-ray plate, but its exact position and relations can be ascertained by stereoscopy, or by applying a localizing method. Fig. XVI* is a beautiful example of this. It illustrates the case of a patient, who was admitted into the Medical College Hospital some months ago for a bullet-wound in the shoulder. The bullet entered the upper arm near the posterior border of the deltoid muscle, and the humerus was obviously shattered. I introduced a probe, and then my finger, but all that could be felt were pieces of the shattered humerus. No part of the bullet was discovered. An X-ray plate was then taken (stereoscopically), and then the condition of affairs was obvious. As will be seen from the reproduction of the skiagraph (Fig. XVI), the bullet which travelled down the arm in the direction shown by the arrow shattered the humerus, it then traversed the tissues in front of the elbow joint. Fortunately, neither the joint nor the important tissues in front of it were injured. The main mass of the bullet is seen at B, flattened out on the surface of the ulna, in a position when one would never have thought of looking for it. Along the course of the bullet are seen numerous fragments (C) about 70 in number, and these can be seen when viewed stereoscopically, standing out in relief. The extreme value of such a plate from the point of view of exact diagnosis and treatment is obvious.

Another interesting plate is reproduced here (Fig. X). The patient was the victim of a recent bomb outrage. The surgical neck of the humerus is seen to be fractured, (A) as also is the coracoid process. A number of sharp spikes, which were driven into the surrounding tissues from the bomb, can also be clearly made out. In this case the arm had to be amputated at the shoulder joint, and this plate and the X-ray screen were of great use in localizing and extracting the iron spikes. I could mention many other instances demonstrating the extreme value of an X-ray examination in such cases, but time will not permit.

Abdominal Examination—In the diagnosis of various pathological conditions in the abdomen, the X-rays afford valuable evidence.

(a) *Æsophagus*—This can be studied by means of the bismuth method, as already mentioned. A useful mixture to employ is bismuth 1 oz., milk sugar ½ oz. and water q.s. Strictures, diverticula and pouches, the position of foreign bodies can all be studied, and recorded by means of a photograph, or by a tracing from the screen.

* Not reproduced.
† T. W. Pryor "The X ray in the Study of Congenital Malformations" *Medl. Record*, New York, November 3, 1906.

(b) *Stomach*—Rieder* has given us some most useful information with regard to the stomach both in health and disease by the bismuth method. It is found that—

(a) In the great majority of cases the stomach is placed vertically, but there is great variability in shape. In the great majority of cases also the whole of the stomach lies to the left of the middle line, and only goes over to the right when filled. The pylorus lies opposite the 1st or 2nd L V and the cardiac end opposite the 10th or 11th D V.

(b) With regard to shape, the most constant type is what has been called by Halzknocht the "cowhorn" type—the characteristic point being that the pylorus occupies the lowest point of the stomach. But many stomachs have what has been termed a "lift," i.e., there is a rise from the antrum pylori to the pylorus itself. Probably both these represent healthy and normal forms. If the transverse colon is inflated, the shape of the stomach is at once changed, the greater curvature being pushed forwards. In most cases in the highest part of the stomach, i.e., at the fundus, there is a large air-bubble present which varies in size.

Examination of stomach—By means of the bismuth meal we can study peristalsis, and still more important we can see anti-peristalsis when this occurs, as in pyloric stenosis. This is a most important diagnostic sign. We can diagnose readily between gastroparesis and dilation and can judge as to the motor activity of the organ thus—

When fed with bismuth 1 oz. and gruel 70 oz. the normal stomach empties itself in about three hours. So that, roughly, if such a meal is given to a patient in the evening and a great part of it is found present in the morning, it is certain evidence of gross incompetence of the motor functions. In some marked cases it is found present for days.

The secretory activity can also be gauged. Schwartz of Vienna has shown that gold-beater's skin is soluble in dilute Hydrochloric acid, the time taken to dissolve it naturally depending on the strength of the acid. The method is to give the patient a test breakfast and fifteen minutes later a capsule of gold-beater's skin containing bismuth. In a normal case this is seen to dissolve in two hours—if hyperacidity is present in one and a half hours or so, and if there is an anacid condition it takes five hours or more to dissolve the capsules. The accuracy of this method can be demonstrated by using solutions of Hydrochloric acid in test-tubes. Such methods are particularly useful when it is not advisable to pass a stomach tube.

Early cases of carcinoma can be diagnosed in this way, while, if the growth is at all dense, it can also be seen as a shadow, but not in early

cases. Such conditions as hour-glass stomach can be quite easily seen.

Similar methods can be employed for the large or small intestine, and much evidence can be adduced in difficult abdominal cases by means of injections of bismuth and olive oil per anum or by bismuth meals. Normally food passes very quickly through the small intestine generally within six hours while it takes over twenty hours to go through the large bowel, and part of it remains there much longer. By watching the course of such a meal or injection, the approximate seat of any condition causing obstruction can be lit off.

Many other obscure abdominal conditions can be diagnosed by X-rays.

(i) Obscure suppuration—subphrenic, psoas, etc.

(ii) Pelvic abscesses.

(iii) Calculous conditions—whether renal, metereal, vesical or appendicular.

(iv) Hepatic abscess.

A great deal of information can be gained in cases of liver abscess by a screen examination, and often an obscure case can be diagnosed in this way. I have made tracings from the X-ray screen in over a score of such cases, and am beginning to realize the possibilities and limitations of this method of diagnosis. Time will not permit of my going into the subject further here, but I hope to have another opportunity of doing so.

CANCER IN TRAVANCORE*

A RESUME OF 1,700 CASES

By WM. CHARLES BENTALL, L.R.C.P., Ed.,

Travancore

WHEN I first came to Travancore six years ago, I was struck with the fact that nearly every second person I met had a tumour the size of a plum in the one cheek or the other, but on closer acquaintance with the people I found this to be a removable quantity, and I well remember making bold to ask a man what that swelling was, and he, taking it as a rebuke, retired to the edge of the verandah and ejected the quid of betel! But I have since found that, erroneous though my first judgment was, there is a close connection between the pseudo-tumour and the real malignant one, and for a few years I have felt that the great frequency of cancer, especially of the buccal cavity, arising apparently from definite secondary causes, should be an indication for the line of investigation for primary causes. Feeling this, I wrote to Dr. Bashford, of the Imperial Cancer Research Fund, for suggestions as to lines of investigation and record, and in the report he sent me I was surprised to find that, in the India Table for 1905, only five cases of cancer of the buccal mucous membrane were

* Archives of Roentgen Ray, March 1908

* Paper read at South India Branch of B. M. A.

X-RAYS AS AN AID TO DIAGNOSIS IN SOME COMMON
SURGICAL CONDITIONS

By CAPT F POWELL CONNOR, FRCS, IMS



FIG VIII

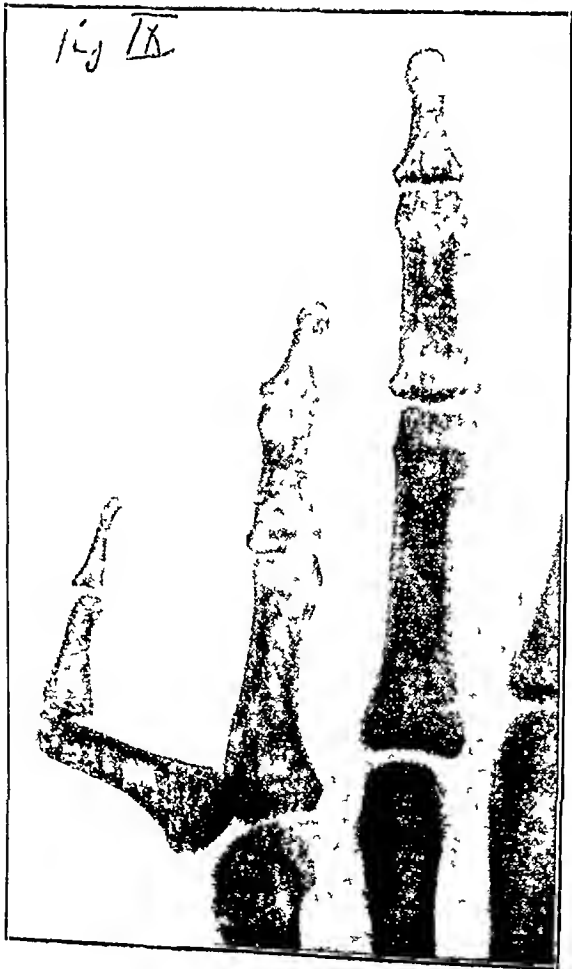


FIG IX.

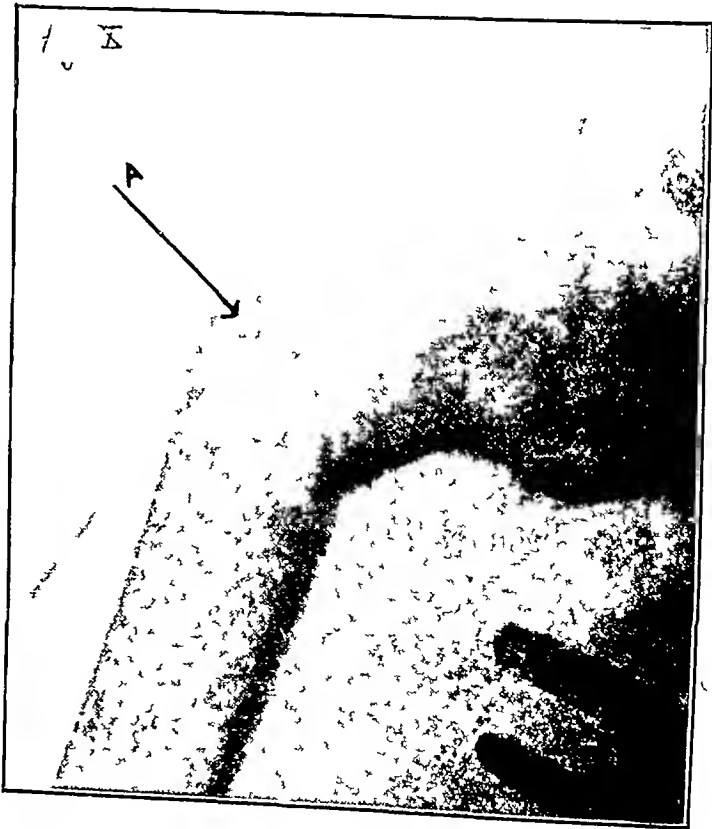


FIG. X.

recorded, and of upper jaws five only, and lower jaws thirty-one. My own report for that year for our Central Hospital at Neyoor showed twenty-eight cases of buccal mucous membrane cancer, and one could not but feel that there was a tremendous leakage of valuable material for the prosecution of this important research work.

And so I have gathered up from our fifteen Mission Hospitals (under the auspices of the London Missionary Society) and also from thirty-four Government Hospitals, by the kind help of the acting Durbar Physician, Dr H Campbell Perkins, the malignant cases seen during the last five years, numbering in all one thousand seven hundred. And I would submit various points arising out of this collection, with the hope that in some small way it may contribute to the investigation of this important subject.

The following divisions are convenient —

- (1) Geographical incidence
- (2) Analysis of 1,700 cases as to age, sex and site of growth
- (3) More detailed résumé of 380 cases under my personal treatment
- (4) Suggestive remarks on buccal cancer in Travancore

(1) GEOGRAPHICAL INCIDENCE

Under this heading my figures are poor, and before submitting this paper for publication I should like to be able to secure the figures of the three great Presidency City Hospitals. Away in the extreme north, in Cashmere, Dr Neve, in charge of the Church Missionary Society Hospital, reports one hundred cancer cases amongst 20,000 new cases annually which equals 5 per cent. At Miraj, in the Bombay Presidency, Dr Wanless, of the American Presbyterian Hospital, reports forty-one cancer cases out of 13,666 new cases annually, a percentage of 3. and at Jammalairadugu, in the Cuddapah District, Drs Campbell and Thomson, in charge of the London Mission Hospital, give fifty-four cancer cases in 6,870 which is just below 1 per cent. And in South Travancore, out of 385,833 cases in our own Hospitals in five years, I find 702 cases of malignancy, which gives a percentage of a little below 2 per cent as the cancer incidence. But in our Central Hospital at Neyoor, it works out to nearly 1 per cent which perhaps is due to a certain notoriety we have attained for operating on such things. I notice also, in the returns kindly supplied to me by Dr Campbell Perkins, that the Hospitals on the hills amongst the planters' coolies show a very much lower cancer rate than those on the plains. In India, of course, we cannot satisfactorily tabulate death-rates from cancer, which would enable us to compare with those of Britain, but the above figures may make a basis of comparison.

Drs Bashford and Murray, in their report of the Imperial Cancer Research Fund for 1905,

say 'It is desirable that the biological aspects of cancer statistics, as they depict the age and sex incidence, the incidence as to organs or primary sites should receive at least as much attention as the subsidiary questions raised by geographical distribution, diet, climate and other external factors.'

(2) ANALYSIS OF 1,700 CASES AS TO AGE, SEX AND SITE

The first table to which I would draw your attention is one showing *age and sex incidence*.

TABLE I—AGE INCIDENCE OF CANCER IN TRAVANCORE IN 1,700 CASES

Age	Males	Females	Total
Under 9	2	5	7
10—15	10	5	15
16—25	27	20	47
26—35	133	95	228
36—45	204	226	520
46—55	317	189	506
56—65	141	130	271
66—75	52	42	94
Over 75	5	7	12
TOTAL	981	719	1,700

The most striking feature in this table, I venture to think, is the fact that the age of maximum occurrence of cancer in Travancore is about twenty years younger than that of Great Britain—a difference most prominently marked in females, where the highest figure is reached between the ages of thirty-six and forty-five in Travancore women. I do not think that this suggests that the menopause occurs younger in Travancore, for although I have not tabulated figures at hand, I have gathered the distinct impression in my work that the menopause here comes on rather later, between forty-five and fifty.

In order to make the comparisons more striking, I have constructed a percentage table for Travancore and English age incidence, the former based on my 1,700 cases, the latter on the report of the Imperial Cancer Research Fund for 1905.

TABLE II—COMPARATIVE PERCENTAGE AGE INCIDENCE OF CANCER IN TRAVANCORE AND BRITAIN

Age	TRAVANCORE			ENGLAND AND WALES*		
	Males	Females	Total	Males	Females	Total
Under 25	4	4.2	4.1	2.1	1.2	1.6
26—35	13.5	13.3	13.4	2.2	3	2.6
36—45	30	31.5	30.7	7.2	11.1	9.2
46—55	32.3	26.3	29.4	19	22	20.5
56—65	14.4	18.1	16.2	30.5	28.4	29.5
66—75	5.3	5.7	5.5	27.2	22.5	24.8
Over 75	5	9	7	11.8	11.8	11.8
Total	100	100	100	100	100	100

This shows clearly that the whole age incidence in Travancore is much lower than that in England whereas in England the highest

*The English figures are calculated from Tables 8 and 9 of the Report of the Imperial Cancer Research Fund for 1905.

cancer rate is between the ages of 56 and 65, in Travancore it is between 36 and 45. Between 56 and 65 in England the percentage is 29.5, while in Travancore at that age it is only 16.2. Again, at Travancore's maximum age of 36 to 45, where the percentage is 30.7, the English figure is as low as 9.2. Six months of this difference may be accounted for by the fact that the English figures are death-rates, while mine are living cases, but I do not think that this sufficiently accounts for the variation. Then again, there is a marked drop in Travancore cases after the age of 65, at which age Travancore shows only 5.5 per cent as against England's 24.8, while after 75, Travancore has only 5 while England gives 24.8. This surely is suggestive that the Travancore cases have died off, which does away with the possible reasoning that the great difference at maximum incidence ages is due to my figures being living ones against the death-rate of the English figures. But at the other end of life there is the same contrast: under 25, the Travancore cancer incidence is 4.1, while the English rate is only 1.6, and from 25 to 36 it is more striking still: 13.0 as against 2.6. Both sexes, with very slight variation, follow the general contrasts which I have mentioned and give rise to no important comparisons.

Surely so striking a difference is at least suggestive of some causative factor occurring earlier in life in Travancore. True it is that the Indian, as a rule, lives a shorter life than the Englishman, but the difference is hardly twenty years, and further, if that be an argument advanced to explain the great difference at middle and later life, it cannot be adduced as an explanation for the difference below twenty-five.

Now let us turn to the *Site and Sex Incidence Table*—

TABLE III—SITE INCIDENCE OF CANCER IN TRAVANCORE IN 1,700 CASES

Site of Cancer	Males	Females	Total
Lip	111	58	169
Tongue	95	63	158
Buccal muc. membrane	420	231	652
Œsophagus	5	3	8
Stomach	2	1	3
Rectum	2	2	4
Liver	1	2	3
Penis	43		43
Breast	1	54	55
Jaw (upper and lower)	156	70	226
Parotid gland	2		2
Sacrum	4		4
Skull	1		1
Scapula	1		1
Arm	6	1	7
Leg	6	7	13
Intestines	2	5	7
Uterus		126	126
Site not stated	118	100	218
Total	960	718	1,700

TABLE IV—COMPARATIVE PERCENTAGE SITE INCIDENCE OF CANCER IN TRAVANCORE AND BRITAIN

Site of Cancer	TRAVANCORE			ENGLAND AND WALES *		
	Males	Females	Total	Males	Females	Total
Lip	11.5	8	9.9	1.3	9	1.1
Tongue	9.8	9	9.4	5.4	4	2.9
Buccal mucous membrane	43.7	32	37.8	1.9	2	1
Œsophagus	5	4	4	6.2	1.4	3.8
Stomach	2	1	1	22	14	18
Rectum	2	3	2	10.2	5.8	8
Liver	1	3	2	13.6	13.7	13.6
Penis	4.4		2.2	1.4		7
Breast		7.5	3.7		16.5	8.2
Jaw (upper and lower)	16.2	9.7	13.3	3	7	1.8
Parotid gland	2		1	3	1	2
Sacrum	4		2	2	1	1.5
Skull	1		0.5	1	0.4	7
Arm	6	1	3.1			
Leg	6	9	7	1.4	0	1.1
Intestines	1	7	4	7	6.5	6.8
Peritoneum		1	0.5		1.6	1.2
Uterus		17.3	8.7		23.1	11.5
Site not stated	12.3	14	13.1	1.3	1.2	1.2

The point which at once attracts one's attention here is the overwhelming predominance of cancer of the buccal mucous membrane in both sexes, forming 34.9 per cent of all cases seen, or if taken with cancer of the lips, tongue, and jaws, they form the large percentage of 70.6 of the whole series. Now these sites in English malignant growths are only 9 per cent for buccal mucous membrane, and in females alone 2 per cent, including lips, tongue and jaws, 5.8 per cent, a sufficiently striking difference to suggest a local cause. A word of explanation is necessary relative to the figures relating to the female genital organs. As is well known, of course, the Indian female, fettered with "purdah" laws and customs, is less likely than even the Western female to seek medical advice on these matters, and hence, probably, figures are fallacious, which fallacy is supported by the fact that half of my figures for uterine and mammary cancer are from two women's hospitals alone. Hence, I feel that comparison here would be of little value.

The low rate of malignancy of the stomach is remarkable also, viz., 1 per cent, whereas English figures give 14 per cent for females, and 22 per cent for males. A similar contrast is noticeable in the figures for liver and gall bladder. Travancore percentage for this site is 1 also, and the English percentage is 13. I admit, as far as my own work is concerned, that the less careful diagnosis in the rash of Indian work, as compared with the definite *post-mortem* results and more elaborate methods of examination in England, will account for some of this striking difference, but not for all, I think. The absence of vomiting of blood, or the so-called "coffee grounds," and the passage of mæna, is a striking feature in one's out-patient work in Travancore, in the presence of so much that is definitely dyspeptic trouble. I have records of medical itinerancy work, showing just over 3,000 cases, when I myself saw every case, and only

* The English figures are calculated from Tables 8 and 9 of the Report of the Imperial Cancer Research Fund for 1905.

two cases of vomited blood and one of "coffee ground" vomit which were definite. And in about 50,000 passed through our Head Hospital I have only seen two definite cases of vomiting of pure blood, suggestive of gastric ulcer (neither serious cases), and three of the "coffee ground" type.

To quote more numerical comparisons would be wearisome in such a paper as this, and the tables will show more detail if needed. But the striking point before one is that, while cancer of the mouth and jaws is exceedingly prevalent in Travancore (far exceeding its prevalence in England), cancer of the rest of the alimentary canal is just the opposite, it being rare in Travancore and common in England—again suggestive of a local cause unconnected with the digestive process.

(3) MORE DETAILED RESUME OF 380 CASES UNDER PERSONAL SUPERVISION

These cases were seen at our Central Hospital at Neyoor during the years 1903 to 1907 and some of the earlier ones in conjunction with my former colleague, Dr. Ellis of Bristol, who, I believe, is publishing details of seventy-two lower jaw excisions done here, and some of the later ones with my present colleague, Dr. Davidson. Of these I operated on one hundred and ninety cases, which consisted of the following—

Seventy-five buccal mucous membrane with involvement of the cheek—Twenty-five of these were sectioned and microscoped, eight showed typical cell-nests, eleven club shaped induplications of the epithelial cells, and six I could not be certain about, their clinical characteristics were all alike.

Twenty-three of the buccal mucous membrane with no external involvement of the cheek—Four of which gave cell-nests, and seven were otherwise diagnostic on section. I leave fuller remarks on these to the last section.

Of the fourteen lip cases, one also showed an involvement of the upper lip, just opposite the growth on the lower lip, and since reading Mr. Bntlin's address on Surgery at the last annual meeting of the B. M. A—"Auto-inoculation," *B. M. J.*, August 3rd, 1907—I have wondered if it would have made a pun to the solitary case he quotes of Von Bergeman's; unfortunately it was one of the cases not sectioned. The distribution of cancer on the lower lip, as described so fully by Mr. Cheandle in recent numbers of *The Practitioner*, I have frequently seen, and his suggested lines of excision I have found most valuable in dealing with these cases.

In the series of twenty-six *half lower jaw excisions*, only three were sarcomatous, one of which, being an exceptionally good specimen, I ventured to bring to show you; it was the more interesting as its original owner was a mixture of rickets and syphilis, as distorted as

a human being could be, with apparently scarcely a straight bone in her body, she was 3 ft. 9 in. high, the skin had broken down over the tumour, and I had refused to operate, regarding the case hopeless, but she and her friends said, "if she dies remove it," so I did. She collapsed badly, and I hardly expected to get her off the table, but she made a good recovery, and went home with a sound wound. For the lower jaw I never do a tracheotomy, and by freeing the internal pterygoid, masseter and temporal before opening into the mouth, sawing through the symphysis and finally turning the head to the side, and running along the mucous membrane with the scissors practically no blood gets down the throat at all. I have never lost a case.

Upper jaws number twelve, with five of them sarcomatous, in only two did I remove the orbital plate, and in one I had to remove both pterygoid plates of the sphenoid to get clear of the growth.

Eighteen tongues were operated on, five being only partial, five were half tongue removals, and eight were complete excisions. Whitehead's operation, plus the splitting of the cheek, was the method always adopted, in two cases tracheotomy was done at the time. In the later cases of this series the complete clearance of the glands along the carotid sheath, from jaw to sternum, together with the submaxillary triangle, as recommended by Bntlin in the *B. M. J.* (Feb. 11th, 1905), had been done a week before the tongue removal, and in two of these cases the lingual was tied, but I never had any difficulty with the ligaments at the operation, save in one case, where there was reactionary hæmorrhage, and we found the patient in a pool of his blood three hours after the operation, two hours with the finger hooked over the root of the tongue, and adrenalin, with salines, pulled him round. All of these tongue cases showed the growth on the side, and seven of them microscoped showed typical squamous epithelioma, and in one case, in removing half the tongue, I came on a hard round lump like a marble, far back, right in the middle line. It came out clean, and section proved it to be a gynaoma, while the marginal growth showed cell-nests.

In six cases of penile cancer, two were removed completely, the corpora cavernosa being removed by raspatories from the ischio-pubic ramus; neither have recurred (two years after) while all amputated cases did recur.

Three cases of encephaloid cancer of the tibia were peculiar, as presenting exactly the same appearances and in the same site (all three were sectioned). The first case, after removal and recurrence twice, I amputated, and show the dry specimen, a second case I failed to get permission to amputate, and so tried to saw and chisel out a wedge in the affected area, but I heard that she died some weeks afterwards.

A sarcoma of the *femur*, and one of the *scapula*, where the whole pectoral girdle was removed, and one of the *right fore-arm*, complete the bony growths. So far, the mortality was nil.

Of *abdominal malignancy* we see but little one case of *pyloric growth*, in which I did a posterior gastro-jejunostomy, died in three days. A case of *multiple colloid cancer* of the abdomen we mistook for an ovarian cyst. She was hardly under chloroform when she ceased breathing, artificial respiration was done and the abdomen opened quickly to relieve pressure, and out gushed great lumps of gelatinous stuff. The operation became a *post mortem*, and twenty-four pints of this jelly-like material were removed. The liver, stomach, cæcum, and uterus all presented great gelatinous nodules, which showed through the collapsed abdominal wall in a most remarkable manner.

Of *breast and uterine cancer*, I have spoken in the preceding section. I have only removed four mammae in Travancore, in one case taking the whole pectoral muscles, and in the others clearing the axillæ only. One supravaginal hysterectomy died fourteen days after operation. This gives a *mortality of 16 per cent* for the one hundred and ninety cases of malignant disease operated on.

I may say in passing, that our section cutting is done on a Cathcart's microtome, with which Bengué's ethyl chloride is used, as the ordinary ether will not work in this climate, and most of our medical students manage it quite skilfully.

Since reading the "Guthrie" lecture in *The Practitioner* for August last, I have examined the gastric contents of six cancer patients in the wards, and found an entire absence of hydrochloric acid, using Boaz's resorcin re-agent, and Uffelmann's carbolic acid and iron re-agent. But from previous examinations made for gastric conditions, and especially at a time when we had a cholera epidemic, I have been struck with the marked diminution of HCl in the stomach, and we have wondered if this had anything to do with the complete absence of acute gastric ulcer already referred to. Chronic dyspepsia and dilatation of the stomach are amongst the commonest ailments of Travancoreans, and their diet, like that of most Indians, has a large excess of carbo-hydrates, and custom, I imagine, has taught them that to meet the proteid demand, huge quantities of rice must be taken, and to increase the ill-effects of this large bulk, they usually only take two huge meals in the day, and in many cases only one. An interesting side-light was thrown on this question at the close of a popular lecture I had given on "Cholera" at a time of epidemic. A highly educated Hindu asked me if there was any scientific explanation of the popular idea amongst them that those who took large feeds of rice at night were more susceptible to cholera. It naturally suggested a greater diminution of

the acid known to be so inimical to the growth of the *comma bacillus*. Finally, I pass on to

(4) SOME SUGGESTIVE REMARKS ON BUCCAL CANCER IN TRAVANCORE

(a) *Nature and treatment of the growth*—It almost always begins in the lowest point of the reflection of the mucous membrane of the cheek on to the lower jaw, just where the "quid" of chewed betel rests in the majority of Travancore mouths. In the *earliest stage* there is a sensation of tenderness, more marked on the eating of hot curries, objectively, the mucous membrane shows increased redness, and the teeth, in the majority of cases, are either decayed, or covered with a black deposit; or in some cases, who are more careless and dirty, coated with a calcareous deposit at the spot where they emerge from the gums, and in the fissures between the teeth. Patients seldom seek treatment at this stage, though effectual treatment is obtained by stopping the betel, a simple mouth-wash, and a saline stomach mixture. *Later on*, the subjective symptoms are usually, decreased sensation, though it may be still hypersensitive, and a change of colour, which, on examination, shows a marked paling, a step towards a leucoplakic condition. I find a mouth-wash (recommended first, I forget by whom) of a diachm of salicylic acid combined with two diachms of borax in ten ounces of water, together with abstention from betel, and the saline stomach mixture, most speedy in effecting a cure here. Then comes the *thickened white epithelial stage*, creeping up the cheek on the one side, or the jaw on the other. Vigorous scraping with a sharp spoon, when the whole mucous membrane peels off in strips, followed by the treatment of the previous stage, often cures, but by no means always, and such cases are frequently back in a few months, more advanced, for further treatment. All these cases salivate excessively, but all betel-chewers do that. Up till now there is no detectable gland involvement. At this stage the growth seems to divide off into one of two directions (1), either assuming the *more rapid, ulcerative and soft form*, spreading up the cheek, rapidly involving the skin, which becoming fixed, then glazed and oedematous, soon gives way, and the foul fungating mass is in great evidence, or, on the other hand, running up the jaw to the sockets of the teeth (which quickly become loose), down on the inner side of the bone, and soon on to the floor of the mouth, and the jaw becomes a soft fungating mass, or both sites may become involved simultaneously. This kind of growth is characterised from the beginning by a most foul smell, the submaxillary lymph glands are early and extensively involved, while the salivary gland is usually found free, even in the late stages. This soft ulcerating form also tends to keep more to the front, leaving the commissure and articulation of the jaw free, and does not produce marked swelling. Such a

patient is generally dead under the year (n) It may pass from the earlier stage into a *hard infiltrating type*, which produces no ulceration until very late stages, and even then of a much less irregular fungating and malodorous type than the preceding. The swelling is marked, either because the growth is in the cheek, which, when gripped between the fingers, is suggestive of a fibrous tumour or early gummatous mass, the outside skin looks healthy, and the mucous membrane even may only show the thickened white character; or the swelling is marked because the jaw has become the seat of a similar growth and is pushing out the healthy normal cheek. This form usually grows backwards, and tends to involve the articulation, and early considerably limits the movements of the jaw, or even entirely prevents the separation of the teeth. In seeing this form, one's first thought is of sarcoma; but the appearance of the mucous membrane, and palpation, easily fixes the diagnosis. Glands are more slowly involved, and by no means so extensively as in the former type.

Treatment now depends on the stage of the growth—it is the treatment of malignant disease on general principles, with perhaps a few convenient variations in technique, *eg*, in early cheek growth, where the skin is not involved, it makes a pretty little operation to turn a flap of healthy skin and subcutaneous tissue up and down from the angle of the mouth, definitely feel the edges of the malignant growth, with a finger inside the mouth, and the thumb outside and finally run round the involved mucous membrane with a knife or scissors, and remove the mass now only held in position by the mucous membrane. No float sponging is necessary, a continuous suture, with a Finner's Balsam dressing, or Michel's clamps, closes the wound and arrests hæmorrhage. Such cases seldom recur. the submaxillary triangle is of course also cleared. I had much more recurrence when I used to try and remove these from inside, owing to the bleeding preventing clear vision of suspicious mucous membrane, and the awkwardness of thus operating spoiled the pleasure of the art. In advanced cases I have learned not to dread the fungating and alarming looking growths to the front so much as the less dreadful looking, hard, dry swellings, reaching up to the lobule of the ear, and involving the articulation; and I am now very chary of advising operation when I find the commissure at all involved, for the internal maxillary sometimes gets divided where involved in the growth, and gives one a nasty couple of minutes, and the cutting off of the involved styloid process, scraping the glenoid fossa almost up the jugular foramen, and working forward to the foramen spinosum, is not satisfactory work. So much for the nature and treatment of the growth.

(b) There remains but one consideration to which I would refer, and it is that with which

I opened this paper, *viz*, the connection of betel chewing with cancer of the mouth. In Travancore, and I imagine in most parts of Southern India, the habit is almost universal, and indulged in from childhood, and with the thought that its composition and method of using might be suggestive along the lines of further investigation, I got some of our medical students to write me essays on the—what shall I call it?—art (!) from which I cull the following—The materials used are areca nut, betel leaf, slaked lime and tobacco leaf, usually soaked in a syrup called "jaggery". The *areca nut* is the fruit of a palm tree, and the kernel, which is the part used, is about the size of a small almond, though more oval in shape. It has a pungent odour, if fresh, an astringent taste, and contains, roughly, starch, sugar, pectids, and a large amount of fibrous material, and some astringent substance. The *betel leaf* is the ovate leaf of a creeper, bright green in colour, and when chewed alone causes marked salivation and a temporary sensation of numbness, after a hot feeling. The *lime* is usually prepared by burning sea shells, though sometimes from stones, its properties are well known. The *tobacco leaves* are prepared with us (though not so everywhere, I understand) by a prolonged soaking in a saturated solution of a sugary substance known as "jaggery," which is prepared from the juice of the fruit stalk of the palmyra palm. The *method of chewing*, in Travancore, is usually to take a few bits of areca nut, and, placing them in the mouth, to chew for half a minute, and then, smearing the betel leaf with slaked lime, to add that too. This is said to produce a pleasant sweet taste, and the increased saliva, becomes bright red in colour, some swallow this, others spit it out. In about five minutes a portion of the prepared tobacco leaf is added, and the whole is chewed into a bolus, and located in the sulcus between the cheek and the lower jaw. Some keep it there for about a quarter of an hour, until it has no taste, and then eject it, while others keep it in for a long time, even up to six hours. If the proportion of lime be increased, there is marked burning sensation, and local anaesthesia, lasting for several hours; and if the tobacco be increased there are all the symptoms of nicotine poisoning. Many men, with their betel, can work hard all day without any food, but to deprive some of their betel is verily to shave Samson's locks.

Summary—

(1) The younger age incidence of cancer in Travancore is suggestive of some definite cause early in life.

(2) Prominence of cancer of the buccal cavity and absence of it in the rest of the alimentary canal, is suggestive of a local cause for the former, but absence of digestive causes in the latter.

(3) The inveterate habit of 'betel chewing' from childhood is suggestive of the cause, either

of mechanical irritation, or also of a medium which is suitable for the growth of a possible cancer germ

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A Mirror of Hospital Practice.

THE TREATMENT OF INJURIES OF AND ABOUT THE ELBOW JOINT

By L M BANERJI,

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DURING my hospital experience of close on four years, I have come across several cases of old elbow injuries which have resulted in either more or less complete loss of movement or frightful deformity. All the more interesting have they been to me when the patients have come with distressed stories of interference with their occupation and daily work through this cause. On enquiry I have always found that from the outset the injury had been neglected inasmuch as passive movements had been long delayed and that the use of splints had been injudiciously applied. This led me to watch all the cases of elbow injury in hospital, with particular interest as to the treatment employed and result obtained. In my own wards an anæsthetic was invariably given in order to ascertain the exact nature of the injury. This is very important as unless the nature of the injury is very apparent, which in most cases it is not, we are apt to make a wrong diagnosis in 3 cases of every 10 examined. The value of screen examination by X Rays cannot be too highly spoken of in these cases but as this is not possible everywhere we have to fall back on the anæsthetic and the sooner it is done the better the result, as elbow injuries are always followed by great effusion in and round the joint.

If however, the case is seen when effusion has already set in, it is much better to treat the effusion and inflammation first than to fix the arm up at once. In this a couple of days should be sufficient after which an anæsthetic will generally reveal the true state of things. It must be borne in mind that a fresh injury is not so painful as one a few hours or a day or two older.

After having arrived at a diagnosis under an anæsthetic or by means of fluoroscope, a definite line of treatment should at once be adopted. The injury must be reduced to as far as possible, normal conditions and methods must be devised to keep it so.

There are several injuries possible at the region. Roughly they are

- (1) Separation of lower epiphysis of humerus
- (2) Fracture of humerus running into the joint
- (3) Fracture of lower end of humerus just about the joint
- (4) Fracture of the olecranon
- (5) Fracture of forearm bones close to the elbow joint
- (6) Dislocations of the elbow joint

In all cases of simple injuries (*viz.*, simple fractures and simple dislocations) a splint jointed at the elbow, is by far the most suitable. It enables movement of the joint without disturbing the relative position of the bones. In injuries of lower end of humerus, the splint answers best when fixed at an acute angle for

the first few days after which the joint should be placed at different angles every second day or so. By this method the joint could be fixed at about 4 different angles within the first fortnight, each position being retained for about two days at a time. The procedure will give the patient less pain, there would be less chance for the joint to be influenced, and there would be practically no necessity of removing the splint, only the screw at the joint loosened and tightened, after the required movement has been done.

After the second week the splint should be taken off to enable free passive movements to be done—especially the movements of pronation and supination. For these movements are the most defective after prolonged immobilisation. The flexion and extension should be done thoroughly, with one hand fixing the lower end of the humerus firmly while the other moves the fore arm to and away from the arm. To do the movements of supination and pronation, the lower end of the humerus should be fixed as before with one hand, while the other hand grasps the palm of the patient, and does the movements.

I have always followed passive movements every other day for the second two weeks after which it should be done daily and even some active movements encouraged. Of active movements, lifting weights and pulley and weight arrangements are very satisfactory. The only drawback is that the patients do not exercise the amount of energy that should be devoted to it.

In fracture of forearm bones similar treatment gives best results, except that the initial fixing should be at a right angle, this angle may vary when adaptation of fragments requires it. The loss of mobility afterwards is not so common in injuries of this kind except that supination and pronation suffer some limitation, especially when both the bones are broken and about the same region—the callus of one bone mixing with that of the other bringing this about. Free supination and pronation frequently will amelioate this.

I have seen only two cases of fracture of the olecranon—both those cases were wired and gave good results—movements were begun very early after the removal of skin stitches, and no untoward results followed. I lost sight of these cases very soon after their discharge from hospital.

I have seen only one case of a simple dislocation of the elbow. That in a child 8 years old. It was a backward dislocation which was reduced easily by extension followed by flexion and which was put up in a rectangular splint. Movement was begun on the 12th day after complete rest. After that she used to come to my outdoor dispensary every other day, and when she ceased coming, the movement was normal, but she used to complain of pain on extreme flexion.

Lately I come to the compound dislocations. I have seen only three cases, and those within almost 4 months of one another. All these cases were complicated with other injuries and were most probably result of indirect injuries. I will mention the cases first. I believe they are uncommon and of interest—

CASE No I

Babulal, aged 18, a strong and muscular young adult, was working in one of the upper stories of a flour mill on the 28th July, when he slipped his footing from the scaffolding and fell to the ground landing, as he said, on his right hand and side. Brought over to the hospital immediately, with his wounds tightly bandaged up with dirty clothing.

On examination I found, 1st—a compound Colles' fracture of the right radius, with the lower end of radius protruding from a transverse wound just above the anterior surface of the wrist. The radial veins were ruptured, but the tendons were uninjured, with the exception of thin sheaths being opened.

2nd—A compound dislocation of the right elbow with the wound on the inner aspect, and the upper end of forearm bones displaced backwards and inwards, and

tip of the coronoid chipped off. The internal lateral ligament and part of the anterior ligament had been ruptured.

3rd—A simple oblique fracture of the surgical neck of right humerus.

4th—A big abrasion on the left side of chest wall over the Spleen.

A considerable amount of shock was present, and the patient was very restless.

Putting the patient under chloroform, I enlarged the wound at the wrist, scrubbed and washed it well, and reducing the lower end of the radius, set the fracture.

The elbow too I treated similarly, but made a counter opening on the outer side, and inserted a through and through gauze drain.

After dressing the wounds at the wrist and the elbow, I set the fracture at the neck of humerus, and put the whole in two rectangular grooved splints, with a straight posterior piece for the humerus.

The patient required a third of a grain of Morphia which kept him quiet for the rest of the day, and the night. In the evening the temperature rose to 100°F. He had passed a fairly good night and in the morning the temperature came down to normal, and remained so throughout his stay in hospital.

The original dressing was left for 48 hours, after which it was changed, and the wounds dressed similarly to be left for three complete days. The second dressing was similar, only instead of a through and through gauze drain, two separate pieces, one on either side, were substituted, on the eighth day after the accident the splints were taken off again and the dressings were removed. Passive movements of the elbow and the wrist were begun, taking care to avoid any movement at the seat of the humeral fracture. This was repeated every second day and the drains were made shorter on each occasion. After the second week, the drains were removed, and parts dressed only superficially after passive movements. On the 23rd day, the wounds were treated, and union had taken place at both the fractures. The splints were removed on the 28th day. The movement at the wrist was perfect, but there was some irritation at the elbow. So the patient was put under chloroform and forcible movement applied, which gave rise to some swelling at the elbow joint necessitating a rest for two or three days. The patient was then made to go through the weight and pulley exercises for a few days. He was discharged on the 7th September, 38 days after the accident. At the time of discharge he had a slight deformity of the wrist, but its movements were perfect, the supination and pronation of the forearm perfect, the flexion of the elbow joint almost normal, but the extension was defective inasmuch as he could do it only half way between at right angles, and complete extension.

The union at the surgical neck was quite satisfactory, some thickening only remaining without any deformity.

The whole course was an uninterrupted progress, there was no fever and the joint remained sterile.

CASE No. II

Debi Din, H. M. 40, Durwan in one of the engineering firms in Howrah, admitted into hospital on the 3rd November 1907. He was superintending removal of a heavy iron beam when he was knocked down, by the beam suddenly slipping from its trolley. He could not definitely say how he fell, but he was picked up with the elbow twisted outwards.

This case was by far the most interesting inasmuch as he had a compound dislocation of the left elbow with dislocation of the sternal end of left clavical. I had never before seen a case of dislocation of clavical. The deformity in this case was not much but the inner end of the clavical was freely movable, so much so that I could lift the end out almost under the skin. It was a forward dislocation. The injury at the elbow was a complete dislocation of humerus inwards with the articular end of the ulna exposed, and the tip of inter-

nal condyle chipped off. The laceration on the inner surface of the joint was clean.

As before I made free incisions on both sides, washed the joint clean and inserted drains. After antiseptic dressings I put the elbow in the jointed splint I mentioned before, in an acute angle, as that was the best position I could keep the joint in.

The difficulty was to keep the sternal end in position. In this I devised a modified Rhoades's dressing. I first brought the arm with the splint on forward on the chest, and fixed it with a bandage after attending to the axilla. Next I fixed a strong "newar" (a sort of broad course tape) strap under the tip of elbow lifting it up against the shoulder, the two ends of the strapping crossing as far as possible over the inner end of the clavicle with a pad intervening between it and the strap, and bringing the ends down on the opposite side under the axilla. In this way, I could keep the clavicle in fairly good position. For the first week, this device answered satisfactorily. But when passive motion was begun, I found that though the clavicle would keep good position under the strapping, it would slip back to its deformity as soon as the strapping was removed. Further the strapping needed constant tightening as it would get loose in a very short time. I still persisted with the method, but it did not fulfil my anticipations in the end. There remained a deformity after the splints were removed, but it did not interfere with any of the arm movements, neither did it give any pain to the patient.

The elbow made a very good recovery, with exactly similar treatment as in Case No. 2, and the patient was discharged from hospital about the end of the 5th week.

There was absolutely no constitutional symptom from the very outset, and the patient went away very happy in spite of his clavicular deformity.

CASE No. III

Foolmoon Chamarni, H. F. 35, cooly woman in one of the Jute mills in Howrah, admitted into hospital on the 13th September 1907. She was carrying a bale of jute when she slipped and fell on her left side, with the jute bale striking on her left elbow.

She had (a) compound dislocation of left elbow inwards with fracture of external condyle. The internal condyle was protruding from the lacerated wound in the inner side of elbow. (b) Compound fracture of both bones of the left forearm at the junction of middle and lower third.

She was seen by me in the hospital very soon after the injury, and, as in the first case, I made free incision on both sides of the elbow, and as the outer condyle was loose in the joint, except for its fibrous attachments, I removed it. After irrigating the joint thoroughly, I put in a through and through gauze drain and dressed it antiseptically.

The compound fracture I treated similarly with counter openings and through and through gauze drains.

The whole extremity was then put up in double rectangular splints.

She required a full dose of morphia to keep her quiet throughout the evening and the first part of the night, she slept under morphia and her temperature remained normal.

The next morning she had a temperature of 102° 8F and complained of throbbing pain about the seat of fracture in the fore arm.

On opening the dressings I found that there was some tension about the seat of pain from accumulated blood, and discharge, necessitating further incision for better drainage. The elbow wound was draining freely.

The course was much the same as the first case, except that the patient always got a rise of temperature when even passive movement was performed.

So I put the arm in a jointed and interrupted at the elbow splint, about the end of second week. This device enabled me to put the elbow in different angle after every dressing.

The fore arm wound healed very quickly and by the third week was almost superficial, but that of the elbow remained for fully six weeks, though the drain had been removed about the end of the third week.

The use of the interrupted and jointed splint gave far more satisfactory result, and certainly the trouble was much less than in the first case. The splint, however, had to be kept for fully 6 weeks on account of the wound in the elbow, but there was always the absence of any apprehension for ankylosis inasmuch as the splint enabled free movement. It had, however, to be occasionally removed to attend to the pronation and supination movements of the fore arm.

The result after six weeks was that the fore-arm had united without any deformity. Pronation and supination almost perfect and the elbow movements much better than those of the first case. There was, however, a slight wrist drop which remained for some time after removal of splints. For the last two weeks in hospital, she used to do the weight and pulley exercises but not so well as the first case as there was the wrist drop. She was discharged at the beginning of the 9th week. I have not seen her since then as she went to her country soon after she left hospital.

In all these cases it will be seen that I followed movements very early, even before the wounds had healed. The results I have obtained have led me to believe that to obtain good and useful results, one must sacrifice the cause of non deformity to that of good movement of joints. A deformed arm with perfect joints is, according to my judgment, preferable to a straight one with limited movements. All my cases have been workmen and all of them were perfectly satisfied with the amount of movement they obtained.

Again in treating compound injuries of a joint, very free incisions which ensure perfect drainage give very gratifying results. One is apt to be conservative in these cases, and generally get into the habit of making as small as possible an opening into joints, with the result that accumulation occurs resulting into constitutional symptoms with possible sepsis, terminating the whole into a fixed joint if not danger to life.

On the other hand, a joint that had been treated more liberally than the one I have mentioned, turns out to be a much more satisfactory one. A little exercise of judgment with careful antisepsis and a joint is not so as one would suppose.

All foreign bodies such as comminutions, lacerated tissues, etc., must be removed, and the whole joint surface got perfectly free and clean. Free opening on both sides with a light gauze drain running through and through, which may be removed altogether by the end of second week, if conditions are as favourable as they should always be, must be resorted to in order to arrive at good results. Movements should be begun early, and should be thorough. The great drawback is that they hurt the patient. The first few movements may be made under an anæsthetic very lightly given.

One of the most annoying features is the wrist drop. This can be prevented by a good support massage, and electrically. The last may only be necessary on a curative treatment.

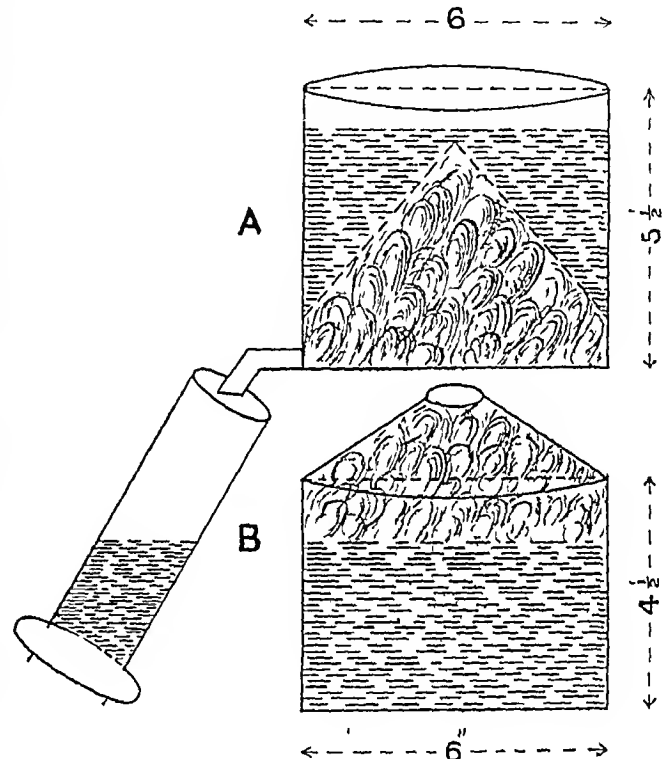
sufficient supply of distilled water without which it is impossible to stain with Leishman and so on.

To overcome this I have had the following apparatus made—

It consists of two tin vessels, one fitting over the other and can be made by any tinsmith in the bazaar at very little cost.

The upper tin marked A has no cover or bottom to it. There is a cone-shaped partition, however, dividing it into two compartments. The upper compartment contains cold water.

Vessel B contains the water to be distilled and has a funnel-shaped neck.



OIL STOVE

Scale $2 = \frac{1}{4}$

There is a gutter-shaped flange (not shown in figure), round the bottom of tin A to catch the distillate, as it condenses on the under-surface of the cone.

This gutter leads into the exit pipe.

A and B have been drawn apart, but are in contact, of course, when the apparatus is working.

A "blue flame" stove is the best source of heat.

A SIMPLE APPARATUS FOR DISTILLING WATER

By N. W. MACKWORTH, M.B.,

CAPTAIN, I.M.S.,

Nagpur



FREQUENTLY great difficulty is experienced by microscopists in this country in procuring a

Indian Medical Gazette.

DECEMBER, 1908

A FORGOTTEN SERVICE GRIEVANCE

BRIGADE-SURGEON ROBERT LIDDERDALE, Bengal Medical Service, retired, died at Torquay on 9th September 1908. Born on 16th April 1835, he was educated at Edinburgh University, where he took the degree of M D in 1857, obtaining the diploma of L R C S, Edinburgh the same year, and entered the I M S as Assistant Surgeon on 27th January 1858. He became Surgeon on 27th January 1870, Surgeon-Major on 1st July 1873, and Brigade-Surgeon on 21st March 1885, and retired on 27th January 1889. Soon after his first arrival in India, he served in the latter part of the Indian mutiny, but most of his service was spent in civil employment in Lower Bengal, where he entered the vaccination department in the seventies, and became Sanitary Commissioner on 9th April 1880. Apart from his official duties his special hobby was entomology. He was the owner of a splendid collection of day-flying moths, which was acquired by the British Museum, and, while serving in Bhutan, discovered a new butterfly, which was named after him.

Dr Lidderdale's name recalls the memory of a long forgotten grievance of the general medical department of the I M S against its special sanitary branch. The medical department of the Indian army was reorganised in 1880, the order instituting the new condition of affairs being published as G G O No 13 of 2nd January 1880. Previous to that year, the medical administration of the Indian army was entirely conducted by Deputy Surgeon-Generals of the Indian Medical Service, the officers of that rank in the Army Medical Department having authority over the hospitals of British troops only. The order above quoted introduced, from the 31st March 1880, a new state of affairs, the number of administrative medical appointments in both services being considerably reduced, while those which remained were invested with authority over the medical administration of both British and Native military hospitals alike.

The military medical administration, under the new orders stood as follows —

Three Surgeon-Generals, all of the A M D, one Principal Medical Officer of H M's Forces

in India, and one each for Madras and Bombay *

Twenty-one Deputy Surgeon-Generals, of whom ten belonged to the A M D and eleven to the I M S, viz

A M D — (Bengal), (1) Allahabad, (2) Meerut, (3) Oudh and Rohilkhand, (4) Rawal Pindi, (5) Sirhind, (6) Peshawar, (Madras), (7) Northern and Central Divisions, (8) Mysore, (Bombay), (9) Poona, (10) Mhow

I M S — (Bengal), (1) Lahore, (2) Eastern Frontier, (3) Presidency, (4) Gwalior and Saugor, (5) Punjab Frontier Force, (Madras), (6) Southern, (7) Hyderabad, (8) Nagpur, (9) Burma, (Bombay), (10) Presidency and Aden, (11) Sind

Though the number of administrative posts open to the I M S was considerably reduced by these new orders, it had been increased within the two preceding years by the appointment of Civil Surgeon-Generals, to Bengal in 1878, and to the Punjab, and to the North-West Provinces and Oudh, (now United Provinces) in 1879. And by the creation of these new civil administrative appointments the work of the I M S Deputy Surgeon-Generals, who used formerly to inspect both military and civil hospitals, had been greatly reduced.

As compensation for the reduction in the number of military medical administrative appointments, clause 10 of G G O No 13 of 2nd January 1880, offered to the Surgeon-Generals and D S G's of the Bengal, Madras, and Bombay armies, two in each army, the privilege of retiring at once on the extra pension of their rank, without completing their tour of qualifying service, five years, in the administrative rank.

About the same time the civil medical administration was reorganised by Government of India, Home Department, Notification No 150 of 15th March 1880. Clause 6 of this order gave to the five Provincial Sanitary Commissioners (Bengal, N-W Provinces and Oudh, Punjab, Madras, and Bombay), the rank and privileges, including the extra pension of £250 after five years service

* The three appointments as Surgeon General are notified as reserved to the A M D, in the original order, G G O No. 13 of 2nd January 1880. An Indian Army Circular of January 1880 states that the Government of India reserved the power of appointing an I M S officer to hold any of these three posts. But as a matter of fact, until their abolition in 1895, none of these posts ever was held by an officer of the I M S.

in the rank, of Deputy Surgeon-Generals, on attainment of twenty-six years service, or as soon as the officer next below them attained the administrative rank. Clause 7 of the same order placed the Provincial Vaccination Departments, which had previously been independent departments, under the Provincial Sanitary Commissioners.

Under these orders Drs Planck (N-W P), H W Bellew (Punjab), and Furnell (Madras), were promoted to Deputy Surgeon-General on the completion of 26 years service, in each case superseding a number of their seniors. Drs Planck and Bellew had not even attained to the rank of Brigade-Surgeon before they became Deputy Surgeon Generals.

Now the grant to the Sanitary Commissioners of the rank, pensions, etc., of Deputy Surgeon-General, on attaining 26 years service, was a very fair compensation to the service, as a whole, for the loss of the military medical administrative appointments which had been reduced. But to the senior officers below the administrative ranks, the Brigade-Surgeons, it was no compensation at all. When they saw that these reductions had deprived them of the promotion, which they might otherwise have reasonably expected, it was small consolation to them that several of their juniors, in the Sanitary Department, had, by a piece of unexpected good fortune, been pitchforked over their heads. Not unnaturally, many of the senior officers protested against their supersession.

The only apparent effect of their protests, however, was, that when Dr Lidderdale, the Sanitary Commissioner of Bengal, attained 26 years service, his name was not placed among those of the Deputy Surgeon-Generals, in the Army List, but remained in its original place, a footnote shewing that he had local rank as Deputy Surgeon-General. Dr Lidderdale got all the solid advantages of promotion, the extra pension for a five years tour as D S G, etc. but, as his name had not actually been placed over them in the Army List, the officers between Dr Bellew and Dr Lidderdale were unable to protest that they had been formally superseded, by the latter. Dr Lidderdale, by the way, completed his 26 years service, and got the solid advantages of this promotion, more than a year before he actually attained the rank of Brigade Surgeon.

No other Sanitary Commissioners, besides the five who held that office in 1880, got the

benefit of this promotion. Government of India, Home Department, Notification No 361 of 30th July 1886, cancelled the orders giving the rank of D S G, at 26 years service, with effect on all appointments to the office of Sanitary Commissioner made after 19th March 1886. As compensation to the service for the loss, four extra pensions of £100 each were given annually, two in Bengal, and one each in Madras and Bombay. Only officers who entered the service prior to September 1889 are eligible for these extra pensions, which were discontinued, as regards all who subsequently entered, by clause 133 of Indian Army Circulars of September 1889.

The reason why 26 years of service was fixed as the date at which the Sanitary Commissioners should attain the rank of Deputy Surgeon-General was, that 26 years was then considered the normal time at which an officer of the I M S might expect promotion to the administrative rank. Even then, this was far from being the case, as most of the then senior officers in the service found, to their cost. Nowadays, with the rate at which promotion in the I M S has run for many years past, the idea sounds Utopian. For a long time past, an officer has been exceptionally fortunate if he attained administrative rank with less than thirty years service. The last officer promoted in Bengal had 31½ years service before he reached the rank of Colonel. There are now in the I M S some sixty officers of over 26 years service, who have not reached the rank of full Colonel, and nearly twenty of them have not yet reached the "selected list," which corresponds to the abolished rank of Brigade-Surgeon.

Current Topics.

THE MEDICAL SCHOOL, RANGOON

WE have read with pleasure the first report of the working of the Government Medical School, Rangoon, which was formally opened by Colonel W King, I M S, C I E, the Inspector-General of Civil Hospitals in Burma. The School commenced in February 1907 with 15 students, of these 9 were Burmans and 6 are classed vaguely as "Indians." Two students left during the year. The working hours of the school are 7 to 9 A.M. and 11 to 4 P.M. Physiology, Anatomy and Chemistry are taught

"The following is a detailed account of the classes held and lectures delivered —

Subject	Number of Meetings	Name of Lecturer
Physiology—Lectures	63	Captain Whitmore, I M S (February to May)
Tutorial classes	109	Major Barry, I M S (May to December)
Anatomy—Lectures	61	Assistant Surgeon Subramanyam (February to April)
Tutorial classes	72	Assistant Surgeon Lamech (May to December)
Dissections	52	Major Penny, I M S (February to December)
Chemistry—Lectures	73	Assistant Surgeon Menon
Tutorial classes	82	Captain Rost, I M S (February to August)
Practical Chemistry	27	Captain Whitmore, I M S (August to December)
		Assistant Surgeon Menon

The attendance at the lectures was good, two students were absent for one and a half months and one month respectively, on account of ill health. Nevertheless the average attendance throughout the session was 965.

The students showed themselves well conducted and desirous of learning, unfortunately several of them were much hampered by a defective knowledge of English. Though they all possessed certificates of having passed the 7th Standard, their knowledge of English was not sufficient to enable them to comprehendingly follow lectures in English on new, and to them somewhat abstruse subjects. In consequence the lecturers had to resort to the method of giving the students set tasks daily to learn and then testing their knowledge by question and answers. Though no doubt this method instilled a certain amount of knowledge into their brains it is not a desirable one for young men. It not only hampers the lecturer and renders his work irksome, but it also keeps back the more intelligent and brighter students. As the question of the standard of qualification desirable for medical students has been made the subject of a previous communication, I do not propose to go further into the question here. The lecturing staff has been sufficient, but it must be remembered there were only the first year's students to deal with. As the school continues and increases there will eventually be four classes of students to instruct, i.e. first, second, third and fourth year's students. The staff of lecturers as now constituted will then be inadequate. At present the Commissioned Officers each lecture twice a week, when the school has reached its full proportions it will become necessary for them to lecture at least once a day. I would point out apart from the time spent on delivering a lecture itself, the preparation of the subject entails considerable time and study. I therefore suggest that it will be advisable at an early date to increase the staff of the lecturers. This might be done by appointing the Chemical Examiner to the staff, and also the second Resident Medical Officer and the Pathologist as soon as these latter appointments to the General Hospital staff are sanctioned. The Chemical Examiner is obviously the man best fitted to lecture on Chemistry and Toxicology. While the Pathologist who is also I believe to be Police Surgeon would have special qualifications for lecturing on medical jurisprudence. The second Resident Medical Officer would probably take Physiology."

It is satisfactory to see that in the annual Examination held last December that the Burman element has held its own. It is of vital importance for the health and development of the province of Burma that a local indigenous class of medical practitioners shall grow up and be trained in modern scientific knowledge, and this school which has now begun deserves the support of all interested in the future of Burma.

We quote the following from the report of Major C C Barry, I M S, the Superintendent of the school:

"As regards the students themselves they have generally shown themselves hardworking and eager to learn, especially I am glad to say the Burmese ones. That good Hospital Assistants can be obtained from amongst the Burmese I feel sure, and that it is only a question of raising the stipends and in placing the school on a thoroughly sound basis to ensure success. At present the extent to which Burmese avail themselves of Western modes of medical treatment is far from satisfactory, and this want of confidence is largely due to the paucity of Hospital Assistants of their own race. The only method of supplying this deficiency is by maintaining a Medical School in Burma and till that is done we must be content with the present unsatisfactory state of affairs."

DESPOTIC HYGIENE OR PREVENTIVE MEDICINE AT PANAMA

SIR FREDRICK TREVELS, Bt, CB, G C V O, F R C S, read a valuable and interesting paper at the epidemiological section of the Royal Society of Medicine (*Proceedings*, Vol I, No 8, June, 1908), in which he gives an account of the work done at the Isthmus of Panama "an enterprise which serves to display the forces of preventive medicine on a scale never before paralleled."

We need not recall the notorious unhealthiness of this Isthmus. Ronald Ross (*Lancet*, 1907, ii, p 866) admitted that the "country is one of the worst to deal with I ever saw." The two diseases which cause its deadliness are malaria and yellow fever.

The Isthmus Canal Commission was formed in 1904, and the United States obtained a grant in perpetuity of a ten mile broad strip through which the Canal is to run. The two towns of Colon and Panama, though not included in the canal zone, are bound to comply with the sanitary ordinances.

The following statistics are instructive. In the year 1905 there were 19,500 men employed, of whom 2,000 belonged to the sanitary section. In that year the death-rate was 243 per mille, and the deaths from yellow fever 47, in 1906 the yellow fever deaths fell to 7, and since then the disease has disappeared.

The sanitary work is under Colonel Goigas, of the Army Medical Department, U S A.

The first steps taken were to house the employees comfortably and hygienically, all doors and windows were screened with copper gauze, public kitchens were established, a vessel was employed to give the convalescents sea

trips in the Bay of Panama. The Hospital at Ancon was improved and is now a modern model hospital.

Then came the great undertaking of making reservoirs to provide a good and constant water-supply. When this was done the numerous shallow wells, waterbutts, tanks and cisterns were removed or closed up. Then followed an extensive system of drainage. Against malaria the crusade was even more elaborate. All are advised to take 3 grains of quinine daily. The drug is found on every dining table and it is distributed broadcast. The dense tropical undergrowth was kept constantly cut down and grass mowed and burnt down*. Another gang of men is employed in making drains, filling swamps and oiling pools and puddles. "In 1906 in Colon town the surface oiled amounted to 330,000 sq. ft. New ditches to the extent of 200,000 lineal feet were made, 20,000 ft. of ditches were stoned or cemented, two million lineal feet of drains were cleared, graded or filled in, and 21 million sq. yards of bush and grass were cleared. Never was such a crusade carried out with such completeness for *never had a chief sanitary officer so free a hand*" (The italics are ours).

It is a pity that Sir F. Treves was not able to give some figures of the cost of creating a modern scheme of sewage disposal for the both towns of Colon and Panama. Full magisterial powers were given to punish for offences against the sanitary orders.

Then the streets of these two towns were levelled, drained and made *pucca* and now instead of "a waste of mud interspersed by a hundred pools" there are good level well drained roads and streets. Sir F. Treves gives no figures to show the cost of these works.

Colonel Gorgas' crusade against yellow fever and malaria then began. The chief diseases, beside these two, are pneumonia due to crowding in ill-ventilated huts, tuberculosis, acute nephritis (to which the Negro is very liable), and bowel complaints. Against the mosquito the houses are so well-screened that mosquito curtains are not needed and not used. The doors are fitted with springs and do not remain open. The yellow fever mosquito, *stegomyia*, is a house insect. If a case occurs the house is made as smoke proof as possible and thoroughly fumigated with sulphur or pyrethium, preferably the latter. Occupiers of houses were fined if the larvæ of mosquitoes were found in their houses.

The only clue to the cost of this administrative Elysium for sanitary officers, is found in a remark of Colonel Macpherson, R.A.M.C., in the discussion which followed, where he mentions that "the amount spent in actual prevention" (whatever that may mean) was two million dollars or say seven million rupees. A big

sum of money truly according to our ideas of sanitary budgets in India.

The above is an example of what "despotic hygiene" can do, but where in India will our sanitarians get the chance of "despotic hygiene?"

MILITARY HYGIENE

SINCE by Army Order 3 of 1908, sanitation is a compulsory subject of examination for promotion of all officers to the rank of Captain, it was necessary that a suitable manual should be written for the use of regimental officers. The little book just published by Messrs. Churchill seems to us to be the very manual required and there is no one better qualified to write it than Lieutenant-Colonel R. H. Firth, whose share in the book which used to be called "Parke's Hygiene" is well known to our readers.

The introduction of the subject of Hygiene into the professional education of soldiers cannot but be productive of good. Military hygiene means the prevention of death and disease among soldiers, and it is satisfactory to know that at long last military sanitation has become recognized as an essential factor in the art of war, and a knowledge of applied hygiene on the part of regimental officers cannot but be an agent in military effectiveness.

Lieutenant-Colonel Firth's little book has no pretensions to convert the military officer into a medical expert. As he says "one can be artistic without being a painter, or one can indicate where a bridge or road should be without being an engineer."

There is no doubt that it was the ignorance of the fundamental principles of sanitary science that made the Commanders of old and up till very recently so unappreciative of technical advice. There is no man so hopelessly unwilling to accept technical advice as the man who has received no technical training of any kind. Military hygiene cannot be regarded with safety as the sphere of any particular corps, it can only be effective and useful with the co-operation of all ranks.

We heartily commend Lieutenant-Colonel Firth's book to our readers in military employ. It should be on the mess table of every regiment in the Army.

BERI-BERI IN THE FEDERATED MALAY STATES

WE extract the following account of an interesting experiment on the use of Siamese (or Rangoon) rice and of Indian rice as a factor in causing beri-beri*. The experiment is apparently not yet concluded, but we here find a clear explanation of the essential differences in preparing the rice according to the Indian method and that in use in Burma and further east.

* Here is a hint for the Municipality of Murshidabad where parts of the town (Lalbagh, etc.) are a dense abandoned jungle and very unhealthy.—ED., I. M. G.

* From the Report of the Institute for Medical Research for 1907) Federated Malay States.

The question is of very considerable importance as nowadays enormous quantities of "Rangoon" rice, as it is called in the Calcutta markets, is imported and consumed in India —

"Hypotheses assuming a connection between rice eating, and this disease have been put forward by numerous observers during the past ten years, but have failed to find favour with most medical authorities. Recently, as the result of observations by a few Government Medical Officers in the Federated Malay States, a considerable body of evidence has been accumulated tending to incriminate Siamese rice as the principal source of a poison which produces beri-beri. This latter view has found its most persistent supporter in Dr W L Braddon, who has dealt with the question in some detail in a recent publication entitled "The Cause and Prevention of Beri-Beri." Without entering into the merits of the arguments that have been urged in favour of and against this hypothesis, it suffices to say that a careful review of the evidence seemed to afford justification for putting the question to the test of experiment.

The variety of names used by writers to describe rice has led to some confusion. In this investigation we are using two kinds of rice, which we shall refer to as Siamese and Indian rice. It must be pointed out that the difference between these two sorts of rice is merely one of treatment previous to milling, and not, as the names seem to imply, a difference in their source of origin.

The rice consumed by the immigrant labourers into the Peninsula is grown mainly in Siam, Burma, Kedah and Province Wellesley, it is imported mainly as padi, and converted into rice in the mills of Penang and Singapore.

To meet the requirements of all classes except the Tamil, white rice is produced—this is the "uncured stale rice" of Braddon, and is the variety believed by him to be the principal source of the beri-beri poison. In making this form of rice no preliminary treatment of the padi is required, it is milled by machinery and the pericarp together with the surface layer of the seed removed. The rice is sold under the names of Siamese and Rangoon, terms which may more or less approximately refer to the country from which the grain has come, but, generally speaking, they are only of commercial significance.

The Tamil labourer prefers a rice similar to that consumed by him in India, and for its production a process analogous to the one in use in that country is employed in the mills here. Large concrete tanks are used, in these the padi is soaked in water for a period of from twenty-four to forty-eight hours, after which the excess of water is run off, the padi is then transferred to lightly covered cylinders, and steamed for from five to ten minutes, after which the padi is removed to open paved courts and dried by exposure to the sun, thereafter it is either stored as padi or immediately milled. The rice so prepared constitutes Indian rice, the "cured rice" of Braddon.

For the purpose of this investigation it was necessary to secure two parties of men under similar conditions as to environment, etc., and whose food supply was under control. Bearing in mind the possibility of the disease being bacterial or protozoal in its origin, it was desirable that no case of beri-beri should have occurred among these men for some time previously, and that the place should be an isolated one, such a situation would, moreover, have the advantage on account of its distance from shops, in that the men could not readily obtain food other than that supplied to them.

In consultation with Dr Braddon, it was decided to avail ourselves of the offer of Mr T R Hubback of his 300 Javanese contract coolies employed in road construction in a remote part of the Jelebu district. These coolies prefer Siamese rice, but, as in the previous year, 1906, several cases of beri-beri had occurred among them,

Mr Hubback, adopting the suggestion of Dr Braddon, had issued only Indian rice, and during the six months preceding the commencement of our investigation no cases of the disease had developed. The coolies had in the meantime been transferred to new quarters and were divided into two parties of approximately equal numbers—one party at Kuala Ayer Buning, thirteen miles from the nearest settlement, Pertang, and a second party at Durian Tipus, eight miles further on towards the Pahang boundary. For many miles about the quarters occupied by these coolies there are no settlements, save a few scattered Malay villages, and abundant evidence has been obtained to show that Malays in such places do not develop beri-beri, the chances of communication with possible sources of infection were thus reduced to a minimum. It was thought, therefore, that the conditions were suitable for an investigation into the part played by rice in the causation of the disease.

The investigation divided itself into two parts (1) systematic observations on the men, (2) chemical examination of the Siamese rice issued.

In April all the coolies were examined by Dr Fletcher and myself, no signs of recent or existing beri-beri were found, an interval was allowed to elapse during which any latent case might be expected to develop, and as all remained healthy Siamese rice was issued to the Durian Tipus party for the first time on the 12th May, the Kuala Ayer Buning party remaining on Indian rice as before. Some time afterwards the exigencies of the road work necessitated the division of the Durian Tipus party into two lots, one lot of about 50 men remained at Durian Tipus and the other lot of about 100 men were transferred to Jintai, three miles from Durian Tipus, and five miles from Kuala Ayer Buning, the conditions as regards food remained unchanged.

On the 7th June Dr Stanton arrived at Durian Tipus and was placed in charge of the clinical part of the investigation. He has since been engaged in making daily examinations of the coolies, determining the incidence of various diseases amongst them, such as ankylostomiasis, etc., that may have a bearing on the development of beri-beri, and especially given attention to the earliest stages of the disease.

Once a month, at least, all the coolies have been examined by Drs Braddon, Stanton and myself. The results of these observations which are of an important character will be given in detail in our completed report.

On the 7th August the first case of beri-beri occurred at Durian Tipus and shortly afterwards a case occurred at Jintai. Between the 7th August and the 12th October there were six cases of beri-beri at Durian Tipus among an average strength of 32 men, and between the 12th August and 14th October there were eight cases at Jintai among an average strength of 100 men. No case occurred at Kuala Ayer Buning.

On and after the 12th October, at Durian Tipus, and on and after the 19th October, at Jintai, Indian rice was supplied in place of Siamese rice. No case of beri-beri occurred at either place subsequent to this change which was the only one made.

On and after the 19th October Siamese rice in place of Indian rice was issued to the men at Kuala Ayer Buning, at which place there were then about 110 coolies. No new men were afterwards allowed to join this party, and none who had been sent to the Government hospital at Kluang were permitted to rejoin. The number of men has in consequence diminished, the object of this procedure was to minimize, so far as possible, the risk of infection being brought into the party. The number of men has been still further diminished by the discharge of coolies whose term of contract had expired. The clinical examinations have been maintained, but up to the close of the year no signs of beri-beri had been detected among them.

From the 12th May onwards two latis of rice were taken daily from the Siamese rice issued to the coolies, these samples have been regularly forwarded to the Institute, and are now being investigated. Considerable progress has been made with this work, but much remains to be done.

It has unfortunately only been possible to perform a very limited number of autopsies 121 were done.

In 49 cases dysenteric lesions were found, in two of these cases the ulceration had extended so deeply in several places as to cause peritonitis and in two cases there was perforation of the bowel. In one of these dysenteric cases gangrene of the lung was also found, in one case there was nephritis, in one cirrhosis of the liver, in one hepatic abscess, and in five pulmonary tuberculosis. Three of the cases also showed evidences of beri beri.

A DANGEROUS OPIUM SUBSTITUTE.

We have not infrequently commented upon the ease with which the cocaine habit has spread in India. We quote herewith an extract from the *China Medical Journal* (Sept 1908, page 307), which shows that another drug has come to the front as an opium substitute. This drug *Mitragyna speciosa* (Korth), or *Poko brik* is not to be confused with *Combretum sundanense*, which is represented to be a cure for the opium habit.

"The leaves of an indigenous tree, *Poko brik* (*Mitragyna speciosa* Korth), are stated in the *Journal of Federated Malay States Museums* to be used in Malaya as a substitute for opium. It is a medium sized tree with large leaves and balls of greenish white flowers. It is widely distributed in Perak, and occurs in the jungle, and is also planted by the natives in and around villages.

The drug is prepared in two distinct ways. In the first the leaves are dried in the sun until they become crisp when they are reduced to powder by rubbing between the hands, the ribs and veins are removed and the powder stored for use. The dose is about 138 grains. The powder is mixed with cold water and the whole drunk or an infusion is made with hot water and is taken like tea. It is usual to take it twice a day before meals.

In the second method of preparation the leaves are dried in the sun and then boiled in water to form an infusion. This is strained and the clear filtrate evaporated to a syrup. In this condition it can be kept for a long time. The syrup is mixed with hot water before taking. The dose is 5.83 grains. Some people just put it on the tongue and wash it down with a drink of water.

The extract is also smoked, after being intimately mixed with the finely shredded leaves of the *Pala palm* (*Lacuna paludosa*). The mixture forms a sticky, fibrous brown mass.

It is a much worse form of drug habit than opium smoking, the effects on its habitual devotees being far more deleterious.

The use of the leaves has previously been erroneously described in this country as a remedy for the opium habit."

TOUTING OPTICIANS

OUR attention has been directed by several Civil Surgeons to an objectionable circular issued by an Indian firm of "manufacturing opticians" in Lucknow, in which attention is directed to the statement that their "terms of commission will be found to be most liberal." The circular goes

on to say that with exception of certain named articles, this liberal commission will be paid, at the rate of 25 per cent on all orders for spectacles, which commission we are told "will be paid monthly or when desired."

This most objectionable circular is labelled inside and outside "confidential." It is evidently not really intended for bona-fide business transactions on behalf of the hospital, or it would not be labelled confidential. At any rate it is most objectionable, and self-respecting medical men will do well to avoid a firm which touts for business in this underhand and objectionable way.

We have just received some books of interest which will be duly noticed, *eg*, Osler's "*An Alabama Student*," a collection of medical biographies (Oxford, Hodder and Stoughton), Dr W J Simpson's "*Tropical Hygiene*" (Bale, Sons and Danielson), and Dr Tiedgold's book on *Mental Deficiency* (Baillière, Tindall & Cox).

DR C P WHITE, the Pilkington Cancer Research Fellow, University Manchester, concludes a series of lectures on the pathology of Cancer (*Med. Chronicle*, Sept 1908), by saying that a parasitic theory will not explain the phenomena, and that "cancer is not due to a specific parasite, but on the other hand we can say that the cancer cells themselves act as parasites. This latter view will explain all the phenomena of cancer."

OUR attention has been directed to a new portable illuminative attachment for the ophthalmoscope, which was shown by its inventor, Dr Clements Hailes, at the Meeting of the Ophthalmological Society and at the recent Oxford Eye Congress. It seems a simple and most convenient apparatus and renders the surgeon independent of all other artificial lights. Hailes' attachment complete, with bulb and 20 hours' portable unspillable battery costs two guineas and is made by King & Co, Park Row, Bristol.

IN *Medical Missions for India* (Oct 1908), Dr A M Kay reports a case of successful treatment of Kala-azar by use of atoxyl 6 grains, increased to 9, and afterwards to 12 grains daily.

THE August number of the *All India Hospital Assistants Journal* make an appeal to the 7,000 Hospital Assistants in India for more support. We think the Journal deserves support, the August number gives a brief history of the Association and the good work it has done since its inception. There are 722 names on the list of members, but considering the low rate of fees for membership this number might well be quadrupled.

Reviews

System of Medicine—By SIR CLIFFORD ALBUTT, K.C.B., and H. D. ROLLESTON Vol. IV, Pt. 1 London, 1908 Macmillan & Co., Ltd

In the new edition of this magnificent *System* the fourth volume has been divided into two. The sections on the nose, pharynx and larynx which were condensed into only 200 pages in the first edition have now been expanded into a whole Volume which will appear as part II of Volume IV.

In view of these changes in Volume IV and also in Volume II it might have been arranged to renumber the volumes, though that after all is but a minor matter.

The present part I of Volume IV contains disease of the liver, kidneys, pancreas and the ductless glands and is a very different book from the old Volume IV. Among the new articles is one by Dr. Keith on hepatoptosis, another by Dr. Wm. Hunter on delayed chloroform poisoning. Dr. Herringham, of "Baits" deals with pyelophlebitis and multiple abscesses of the liver, and an excellent new article on biliary cirrhosis is contributed by Morley Fletcher.

The chapters on infantilism and oedema are very good and the same may be said of those on obesity and adiposis dolorosa by Dyce Duckworth. Prof. Rose Bradford has a long and important article on nephritis and Dr. Dickenson treats of albuminuria.

The whole volume is good and is of great value for the practitioner who wishes to keep himself informed of the recent advances in medical knowledge.

Legal Responsibility of the Drunkard—By H. NORMAN BARNETT, F.R.C.S. Baillière, Tindall & Cox, 1908 Pp. 64 Price, 2s. 6d.

WE can well agree with Mr. Barnett when he says that a book dealing with the legal responsibility of the drunkard from the medical standpoint has been much needed by both the medical and legal professions.

The present little book aims at showing how far the alcoholic criminal is responsible and we can say that Mr. Barnett has well succeeded in his aim.

No doubt drunkenness is at first a vicious habit, which later on develops into a disease the difficult question to answer is in the case of borderline cases. Legal tribunals are at last realising to some extent, that in dealing with a chronic alcoholic they are in contact with a man who should be treated chiefly in a remedial way. The Act of 1898 was really the first useful legislation on this subject. The weak point however in this Act is the chronic drunkard. It is necessary that he shall be sentenced to treatment in a state reformatory whether guilty of an indictable offence or not and with or

without his consent. This sentence of imprisonment for treatment should be long enough to give the wretch's diseased nerve-tissue an opportunity of rest.

We commend this little book to the notice of our readers. Cases of this kind are not common in practice in India, but they do occur and a perusal of this little book will greatly help the medical officer who has such to deal with.

A Manual of Diseases of the Eye—By CHARLES H. MAY, M.D., New York, and CLAUD WORTH, F.R.C.S. (Eng.) Second Edition Pages XIII and 400 Illustrations 336, including 22 coloured plates. Demy 8vo, 10s. 6d. net Baillière, Tindall and Cox, 8, Henrietta Street, London.

A MANUAL on a special subject which requires the publication of a second edition in two years, owing to its popularity scarcely requires a lengthy notice. Few alterations have been made in the text. Although extraction of cataract in the capsule has been the subject of much controversy since the first edition was published and that not alone in India, yet no mention of it is made in the text.

The coloured plates are still an excellent feature of the work.

For a concise and practical description of the subject the book can be thoroughly recommended to the student.

Index Catalogue of Medical and Veterinary Zoology, Trematoda and Trematode Diseases—By C. W. STIRIS and HASSALL WASHINGTON Government Printing Office, 1908.

THE object of the catalogue is to place in permanent form the card-catalogues of the Zoological Division of the U. S. Bureau of Animal Industry. It is an Index and not a treatise. We have therefore done enough in calling attention to its existence. It is a wonderfully complete index of the subjects.

Green's Encyclopedia and Dictionary of Medicine and Surgery—Vol. IX Rhinoliths to Thermostoxis. Edinburgh and London Wm. Green and Sons.

THIS is the penultimate volume of this huge Dictionary and Encyclopedia of Medicine and Surgery. We have frequently called attention to the subject-matter of this monumental work. The present volume is quite equal to its eight predecessors and contains among much else up-to-date articles on syphilis and small-pox and notable articles on tabes, and spinal cord diseases. To keep this up-to-date the Editor Dr. J. W. Ballantyne announces the preparation of a *Quinquennium of Medicine*, which will no doubt be very useful and necessary.

Hygienic Laboratory of the United States.—Bulletin No. 40.

THE last published of these bulletins contains four papers, all by Stokes, who in the case of the last is assisted by Goldberger. The first is on the occurrence of a proliferating cestode larva in a man living in Florida, which has been

named *Spariganum proliferum*, and which is considered as identical with a parasite described by Ijima in Japan. In the Florida case there were thousands of nodules situated in the subcutaneous tissue, in intermuscular strata, there were large masses in the abdominal cavity, the liver and spleen were enlarged. Most of the nodules under the skin were of the size and shape of grains of rice. They were little cysts containing one to three larval worms, the largest of which measured 12 mm long. Their shape was irregular owing to the formation of buds, which possibly then separated forming fresh individuals. The larvae were unattached and destitute of hooklets or suckers.

The second paper is the record of a re-examination of the original specimen of *Filaria testiformis* described by Leidy in 1880. It was supposed to have come out of the urethra of a man of 50. The conclusion is that it is not a filaria, and was probably not a parasite of man at all.

Two new nematodes are next described, one from the pectoral muscle of an African partridge, and the other from the cæcum of calves from the Philippines.

The last article gives the result of a re-examination of the original specimen of *Tenia solium abietina* described by Weinland in 1858. Four out of five helminthologists who examined the specimen, considered it to be a *Tenia saginata*, and it is accordingly classified as a doubtful subspecies *Tenia saginata abietina*. These valuable and beautifully illustrated bulletins should be far more widely known than is at present the case.

Diseases of the Genito-Urinary Organs and Kidney.—By ROBERT HOLMES, A.M., M.D., AND HARLOW BROOKS, M.D. Published by W. B. Saunders & Co. Pp 356. Illustrations 292.

In their preface, the authors do not profess that the work is a complete one, this being impossible in a book of this size. They have attempted to devote the greatest amount of space and the fullest description to those conditions and methods which have appeared to them to be of the greatest importance or to those which, being of recent development, may be presumed to be less familiar to the practitioner. In pursuance of this policy we find considerable space devoted to endoscopy, cystoscopy and catheterisation of the ureters. Examination of the urine is dismissed shortly, while the part describing examination of the urethral exudate and of the semen is fuller. There are complete useful chapters on the treatment of nephritis, on uræmia, tuberculosis, stone and tumour of the kidney. The chapters on prostatic disease are interesting. Gonorrhœa is connected with cancer of the prostate thus: "The gonorrhœa leaves behind a chronic posterior urethritis, from this a chronic prostatitis results by infection through the prostatic ducts, careful study

of many sections from 58 cases of prostatic enlargement has convinced the writers that the hypertrophy is really inflammatory in origin, the consequence of this infection, and they are equally satisfied that cancer was present in from 5 to 10 % of the prostates referred to, and that it followed the inflammatory sclerosis. Holding as they do this view, we do not think that they recommend with sufficient emphasis the removal of the enlarged prostate in place of the entry upon catheter life."

In the consideration of stone, there is that tendency to provincialism which is to be found all the world over in medical affairs. The experience of the authors is here admittedly scanty, and they rely for methods of treatment on that of Chismore, who performed lithotomy 154 times, and their recommendations are as follows. One and a half to three ounces of a four per cent solution of cocaine are injected into the bladder. This means from half to one drachm of cocaine, and it is to be noted in this connection that Morell says that any quantity of cocaine exceeding half a grain cannot be applied to a mucous membrane without the risk of alarming symptoms arising. If this quantity does not give satisfactory anæsthesia, it is run out and fresh cocaine solution applied. For the crushing a lithotrite with a channeled stem is advised, that is, it combines the uses of lithotrite, and evacuator, a device which must weaken the instrument and render it useless for the crushing of a large hard stone, and indeed that the instrument is one of little power is evident from the fact that it is fitted with three separate devices for crushing the stone, firstly, a handicap, secondly, a ratchet and pinion, and thirdly, if these fail, a hammer. To Indian Surgeons accustomed to a simple instrument powerful enough to crush any stone, which it is large enough to grasp, the uselessness of such complex arrangements is evident. It surely must be conceded that in these days when the facilities for the diffusion of medical knowledge are so great, no author can be excused for failing to supplement his own experience, in any direction in which it is slight, by that of those, in whatever part of the world they practise, whose experience is the greatest, a six-inch incision for suprapubic lithotomy is certainly as a routine measure unnecessarily large.

The perineal route is recommended for prostatectomy in most cases, and here we certainly think that a reference might have been made to Freyer's figures of the suprapubic route. In operating for cancer of the penis, there is no reference to the advisability of removing the whole lymphatic drainage area in the groins, and in our experience it is, when operating for the radical cure of hydrocele by inversion of the sac, not sufficient to merely pull the testis through the hole in the sac wall. It will slip back through the aperture, unless the sac wall is sutured back. The book is well and

profusely illustrated, and is on the whole a good and useful one

Points of Practice in Maladies of the Heart—By JAMES SAWYER, KT, MD (LOND), FRCP, FRS (ED), FSA. Published by Cornish Bros, Ltd, Birmingham, p 104 Price 2s. 6d

THIS book is a reprint of the Lumlilan Lectures for this year. After a brief historical review illustrative of the changing standpoint resulting from widening knowledge, and a more minute reference to recent advances in the latter, such as Cyon's development of his hypothesis that the thyroid, adrenals, and pituitary body are glands having the special function of regulating the nerves of the heart and the influence of the bundle of His on the cardiac beat, the lecturer emphasises the close connection between advance in physiology and in this branch of medicine. The second lecture is on physical signs and contains three points which seem to call for special notice. The first is associated with the name of Waller, namely that the impulse beat is not the apex beat, but that a needle thrust into the heart at the site of the former will enter the ventricle at the junction of the lower and middle third, the second is an observation that certain cardiac cases can hold their breath even more than three times as long as can a normal individual, and phenomenon which the lecturer associates physiologically with Cheyne-Stokes breathing, and clinically, in all probability, with cases in which there is no blocking in the pulmonary circuit, the third is the description of a special stethoscope for cardiac auscultation, fifteen inches long, made from a single piece of cedar wood, the ear piece as usual, the chest-piece a hemisphere $\frac{3}{4}$ of an inch in diameter, the stem tapering evenly from this size to one having a diameter of $\frac{3}{8}$ of an inch where it passes into the flat aural end. The last lecture deals with various points in cardiac disorder and disease. The frequent association between functional disorder and disease is emphasised by the statement that many a case of heart trouble, in which the heart is obviously diseased, is best treated by leaving the heart alone and directing attention to the removal of external causes of functional disturbance. The "consultation murmur" is looked upon as intra-cardiac. The place of exercise in treatment is shown, and in laying stress on the valuable part alcohol may play in properly selected cases he gives preference to usquebaugh, and to ipociasse, a red Burgundy containing ginger and other spices.

Operating Midwifery.—By J M MUNRO KERR, MB, CM, Glas, FFPS, Glas, Obstetric Physician, Glasgow Maternity Hospital, Gynecologist, Western Infirmary, etc, etc pp vii + 705 Illustrations 294 Royal 8vo London. Baillière, Tindall & Cox, 1908. Price, 21s net

We have perused this work with much pleasure and profit, as it is written by one who

evidently speaks from the height of a large practical experience of operative midwifery and who moreover writes in a broad minded and judicious manner. Not only are the various operations of midwifery very fully and clearly discussed, but a considerable portion of the work is devoted to the consideration of the indications for the various operative measures, and the advantages and disadvantages of different methods of treatment are very fully and fairly dealt with.

In discussing the treatment of face presentations the author advises the expectant treatment in preference to routine interference, as giving the more satisfactory result. Among the various methods of dealing with the after-coming head in breech presentations the importance of having the forceps always in readiness is laid stress on, and there is no doubt that this treatment is coming more and more into favour as its advantages over the other methods are coming to be more fully realised. The section dealing with contracted pelvis is very full and complete, as to the treatment of this condition it is pointed out that this must be based upon the relative size of the foetal head and of the maternal pelvis and not only on the size of the conjugate. The author favours the application of forceps rather than version as giving better results to both mother and child and states that version has been abolished in the Glasgow Maternity Hospital for some years, but the proviso is made that forceps should rarely be used if the true conjugate is below $3\frac{1}{2}$ inches, that the head must be well fixed in the brim and that only moderate traction must be employed.

In discussing the question of Fibroids of the Uterus complicating pregnancy, a rightly conservative view is taken. In the chapter dealing with the application of Forceps, the deliberate application of the blades to the sides of the child's head is recommended in preference to the application to the sides of the pelvis as is more usually taught, it being contended that a better grip of the head can be obtained in this way.

As to the vexed question of the place to be taken by Symphysiotomy in obstetrics, and the relative advantages or disadvantages of this operation as compared with Pubiotomy, the author has come to the conclusion that the operation fills a useful place under certain well defined conditions, and that it is to be preferred to Pubiotomy as likely to give rise to less troublesome hæmorrhage among other reasons.

Mechanical dilatation of the cervix is given a definite place as a legitimate and useful operation in certain cases.

In treating of the various methods of extracting the foetal head after perforation the great advantages of the three bladed combined cranioclast or cephalotribe are pointed out and stress is laid on the application whenever possible of one of the blades over the child's face.

We think enough has been said to show that the teaching is sound, up-to-date, and in accordance with the most approved ideas of British practice. The book is well and clearly printed, the illustrations numerous and excellent. We think the work fills a distinct gap in obstetrical literature and can most cordially recommend it as being a most excellent sound and useful guide which should be in the hands of all those who have at all an extensive practice in midwifery.

The Edinburgh Stereoscopic Atlas of Obstetrics.—Edited by G. F. BARBOUR SIMPSON, M.D., Edin., F.R.O.P., Edin., F.R.C.S., Edin., Senior Assistant to the Professor of Midwifery in the University of Edinburgh, and EDWARD BARNETT, B.A., M.B., Ch.B., Edin. With a preface by Professor Sir J. HALIDAY CROOM, M.D., F.R.C.P., F.R.C.S., Edin., F.R.A.C., Professor of Midwifery in the University of Edinburgh. In four Sections, each containing 25 subjects, with descriptive text section II. London. The Caxton Publishing Company, 1908. Price not stated.

THIS Section consists of 25 stereoscopic photographs mounted on thick cards, with short descriptive letter-press above each.

The series includes photographs of the Scotic-Rachitic and acromegalic giant pelvis, of the gravid uterine at various periods of gestation from the third week to the eighth month and a series of views illustrating the normal anatomy of the female pelvis and of the internal or external organs of generation. The photographs are most beautifully executed, but some of the subjects do not readily lend themselves to this form of illustration and certain of the pictures, as for example the ones of the external organs of generation, really shows but little, in others however such as those illustrating the pelvic deformities or the method of measuring the conjugate diameter of the pelvis, the special points are clearly brought out in the photographs.

The notes are clear, concise or well printed, and the mounting and general production of the Atlas leave nothing to be desired.

We think these photographs are likely to be of considerable aid to students and practitioners and especially to teachers of Midwifery.

A Short Practice of Midwifery for Nurses as used in the Rotunda Hospital, Dublin, for the past ten years.—By HENRY JELLIOTT, B.A., M.D. (Dub. Univ.) F.R.O.P., Gynecologist and Obstetrical Physician, Dr. Steeven's Hospital. Ex-assistant master, Rotunda Hospital, etc., etc., pp. XIII, 463. Plates six, Illustrations 164. Third edition, revised. London, J & A Churchill, 1908. Price, 6s 6d net.

THIS book is now so well-known as one of the best of its class that any detailed review would be superfluous. The new edition has been thoroughly revised, a large number of new illustrations have been added, together with the regulations of the Central Mid-

wives Board and a short note on the early symptoms of cancer of the Uterus. It well maintains the high standard of the preceding editions and has been considerably improved by revision. The work can be confidently recommended to all obstetrical nurses as a thoroughly useful and practical guide and moreover one that is clearly and simply written. It is well printed and fully illustrated.

Analytical Index, Vols. I to X, of the Medical Review 1898—1907. London, "Medical Review," 1908. Price, 7s 6d.

To those who possess the volume of the excellent illustrated publication known as the Medical Review, this analytical Index will prove invaluable for reference. It is exceedingly well got up, beautifully printed, and in many respects it resembles the well known Neale's digest, though of course it is an index only to the Medical Review, but there is little of general interest that is omitted in the *pieces* and synopsis of the Medical Review each month.

ANNUAL REPORTS,

HOSPITALS

I

BENGAL

COLONEL R. MACRAE, I.M.S., submitted the Triennial report from which we make the following Extracts—

In 1906 a scheme for the practical training of medical officers and subordinates in the use and management of the X-ray apparatus was sanctioned by the Government of India and an Institute for this purpose was established at Dehra Dun. Medical officers and subordinates selected by the administrative medical head of the province are deputed, with the sanction of the Local Government, to attend the institution, the officers so sent drawing the salary they were in receipt of at the time and the usual travelling allowance under the Civil Service Regulations. Under this scheme two Indian Medical Service Officers, two Military Assistant Surgeons and two Civil Assistant Surgeons of this province have undergone the prescribed training.

Owing to the WISE AND UNPRECEDENTED LIBERALITY of Government the triennium under report has been one of exceptional progress in every direction. Calcutta hospitals have been modernised and altered beyond recognition, throughout the Province many new hospitals have been completed or are under construction, or have been sanctioned, all have been greatly improved and well equipped, type plans of OPERATION-ROOMS AND OF out-door departments of hospitals on modern lines have been issued, and many hospitals have already adopted them. In short, the medical institutions of the province generally have been very largely brought up to date during the past three years. But there still remains much to be done before the medical needs of Bengal are adequately met.

A new medical curriculum has been adopted for the Medical College in accordance with the new University Regulations and additions have been made to the professional staff and others are under consideration to provide the requisite training. The rules for admission to medical schools have also been revised.

The ranks of the provincial service have LOST BY DEATH AND RETIREMENTS some of its ablest members—

(1) Major D. M. Moir, I.M.S., an able and conscientious practitioner and accomplished surgeon and teacher, died in Calcutta on the 5th June 1907, as the result of septic poisoning contracted in the execution of his duty.

(2) Lieutenant Colonel H. J. Dyson, I.M.S., an expert sanitarian and energetic officer, died on the 2nd September 1907 at the Presidency General Hospital from climatic causes and long service.

Assistant Surgeons Prasupati Nath Das and Bepin Behari Mukherji, two very promising young officers, died from blood poisoning at the Sambhu Nath Pandit Hospital in

Bhawanipore on the 12th June 1906 and the 27th September 1907, respectively.

As I write I mourn with much regret of the sad death of Lieutenant Colonel F S Peck I M S, on his way home on sick leave. In him the service has lost a very able officer, and Government a loyal and faithful servant.

The following officers retired during the triennial period under report—

Lieut. Col U N Mukherji, I M S,	on the 17th Feb 1907
" J H T Walsh I M S,	" 21st July 1907
" R R H Whitworth, I M S,	" 17th Sept 1907
" J Lewis, I M S,	" 21st Nov 1907
" F A Rogers, I M S,	" 16th Dec 1907
" H C Brown, I M S,	" 1st Jan 1908
Colonel S H Brooke, I M S,	" 29th Apr 1908
Lieut. Col D Plain I M S,	" 31st July 1908
" R Cobb, I M S,	" 10th Oct 1908

During the current year, 1908, Lieutenant Colonel J B Gibbons, I M S, retired on the 17th February and Lieutenant Colonel Sir Havelock Charles on the 20th March. Lieutenant Colonel J French Mullen, I M S, will retire on the 25th May.

The following medical officers contributed largely to the total number of important operations performed during the period under review—Major F P Maynard I M S, 2009, the late Lieutenant Colonel F S Peck, I M S 976, Lieutenant Colonel E H Brown, I M S 821, Lieutenant Colonel C R M Green, I M S, 418, Captain J J Urwin I M S, 301, Major R Bird, I M S, 271, Assistant Surgeon Satish Chandra Das, 1,057, and Assistant Surgeon Brahm Das Mukherji 478. As formerly remarked however numbers are no certain indication of the standard of surgical work done.

During the three years under review the important hospitals in Calcutta have been vastly improved at a huge cost in respect of buildings, equipment, furniture, surgical instruments and appliances, beds and bedding, establishment and in other arrangements tending to the comforts and conveniences of the patients and general attractiveness of the hospitals.

The following remarks on the urgent need of a special TUBERCULOSIS HOSPITAL are well worth quoting—

For tuberculosis 2,391 patients were treated in 1907, 2,483 in 1906 and 2,477 in 1905, the figures for the previous triennial period being 2,158 in 1902, 2,101 in 1903 and 2,078 in 1904. The greater incidence of the disease in the three years under review may in some measure be due to better registration but it is also indicative of its greater prevalence. Taking individual hospitals there was a progressive increase in the Medical College and Campbell Hospitals. A special hospital for the segregation and treatment of cases suffering from this infection is undeniably required to meet the requirements of Calcutta. I referred to this subject in my notes in the returns for 1906. It is in the later stages of the disease that it is most dangerous and such cases cannot be suitably treated in the wards of our general hospitals. The efforts of benevolent, wealthy and charitable people in other countries have already provided them with special hospitals for chronic and incurable cases with results not only beneficial to the individual, but to the community generally. Already as a result of the efforts made, a sensible reduction in the incidence of the disease is apparent. The matter is of the utmost importance to Europeans and Indians alike and their joint exertions are desirable in raising funds to found the required hospital.

The following regarding Hospitals out of Calcutta.

The total number of SURGICAL OPERATIONS performed in the dispensaries rose from 152,227 in 1904 to 155,680 in 1906 and 159,566 in 1907. The form of the return in which the work of State—special, railway and private non-aided dispensaries under Government supervision is shown does not furnish the details of surgical operations performed in them. Some of these private institutions are large and important. During the past year I endeavoured to obtain for them some monetary help from District Boards, so as to change their status and bring them under class IV—Private aided institutions. There were 160 deaths after operation, or 14 per cent, in 1905, 172 or 15 per cent, in 1906, and 180, or 14 per cent, in 1907. As stated before, the surgical equipment and aseptic appliances in dispensaries have been recently much improved. Of the important operations, there were 2,239 extractions of the lens in 1905, 2,714 in 1906, and 2,884 in 1907. Success in these operations has a double effect, viz, it increases the popularity of the hospital and, as a logical consequence, the attendance. The percentage of success calculated on the total discharges in 1907 was 81.12, which is satisfactory. Of the total number operated on, 44 remained under treatment at the close of that year. There were 80 lithotomies, against 81 in 1906 and 93 in 1905, while lithotomies were represented by 124, 124 and 117 cases respectively. As most of our large hospitals are now provided with suitable lithotripsy instruments, the proportion of lithotomies still performed is surprisingly large. Amongst other important operations performed in 1907, amputation

above the hand numbered 113 with three deaths, those above the foot were 60, of which 12 died, most of the casualties occurring amongst prisoners who had been injured. There were also 1,285 removals of tumours six ending fatally. As regards important abdominal surgery, ovariectomies numbered 17 with five deaths, and 64 laparotomies with three deaths. There were 105 removals of scrofula tumours with only one death, 78 cases of radical cure of hernia and 55 operations for strangulated hernia with one and five deaths, respectively.

Including Calcutta hospitals the total number of operations performed in Bengal was 191,414 in 1907, 185,270 in 1906, and 182,337 in 1905. The following are the officers who performed the largest number of operations during the period under review—Lieutenant Colonel C E Sunder, I M S, Gaya (1,303 operations), Major D H Dore, I M S, Champaran, Patna, and Hazaribagh (574), Major A Gnyther, I M S, Durbhanga Sam and Cuttack (376), Major E W Waters, I M S, Puri, Murshidabad and Cuttack (348), Lieutenant Colonel T Granger, I M S, Muzaffarpur (351), Major B C Oldham, I M S, Cuttack and Patna (312), Major C R Stevens, I M S, Champaran and Cuttack (308), Military Assistant Surgeon J O Gillman, Serampore and Sambalpur, performed 206 operations. Senior Assistant Surgeon Hari D S Maitra, Dinniron (1532), Assistant Surgeon Titumra Charan Guha, Bettiah (518), Assistant Surgeon Dobendra Nath Hazra, Cuttack, Purnea, Berhampore, Dinapore, and Kandi (411), Assistant Surgeon Satish Chandra Bhowmik, Beguheri and Muzaffarpur (338) and Assistant Surgeon Chandra Kanta Chakrabarti (Chapra 1351). The total figures show much increased activity in the surgical work performed throughout the Province.

During my inspections of dispensaries I noticed that the stock of medicines kept in them was in most cases sufficient, while in others there was a tendency to extravagance. A certain class of the public have a mania for indulging in pharmaceuticals from the most potent and proprietary medicines which should not find a place in dispensaries, and local medical officers do not always resist the temptation of supplying them. They would probably otherwise find things more unpleasant for them. On the other hand, the amount spent on febrifuges in some hospitals is small and might well be increased alike for the reputation of the hospitals and the good of the sick. Miscellaneous charges amounted to Rs 52,223 in 1905, Rs 87,135 in 1906, and Rs 80,919 in 1907. Expenditure under this heading includes the cost of beds, bedding, clothing, furniture and other articles of hospital comforts and conveniences, all of which were much improved, as funds permitted, in the triennial period under review.

II

EASTERN BENGAL AND ASSAM

THE Triennial Dispensary Report for 1905-07 has been submitted by Colonel D Wilkie and is the last report to come from his pen as he has gone home pending retirement. We make the following extracts from this report—

The Civil Surgeon of Sylhet but voices the general opinion when he says that too much stress should not be laid on the number of attendances as a gauge of the popularity of a hospital assistant, and that the returns of attendance are apt to be exaggerated. He ascertained from personal inquiry among the villagers that records of attendance are not always what they seem.

MALIGNANT DISEASE was represented in the returns of the dispensaries of Eastern Bengal and Assam by 233 cases of cancer and 145 of sarcoma in 1905, 200 cases of cancer and 103 of sarcoma in 1906, 237 cases of cancer and 173 of sarcoma in 1907. The inquiries of the Cancer Research Fund Committee have drawn the attention of medical officers specially of late years to the noting of cases.

The total number of SURGICAL OPERATIONS, both principal and secondary, performed in the dispensaries of classes I, III and IV rose from 73,959 in 1905 and 74,156 in 1906 to 76,366 in 1907. The number of persons operated on in the last year of the triennium was 75,594, as compared with 73,474 in the second and 73,044 in the first. Out of the 75,729 patients, including those remaining from 1906, 73,624 were cured, 1,551 were relieved, 308 were discharged otherwise, 100 died, and 148 remained under treatment. The percentage of cures being 97.22 in 1907, against 97.06 and 97.47 in 1906 and 1905 respectively. The number of deaths after operation was in 1907 100 in 1906 117, and in 1905 113, or 0.13, 0.16, and 0.15, respectively, per cent. Among the operations were included 751 removals of solid tumours, 431 removals of cysts, 8 operations on arteries, 6 for aneurysm, 5 on veins, 272 amputations, 26 operations on the skull and brain, 84 iridectomies, 710 extractions of lens for cataract, 4 eviscerations of eye ball, 3 tracheotomies, 15 excisions of breast, 1 excision of thyroid body, 22 laparotomies, 1 excision of the

stomach, 3 enterectomies, 1 colotomy, 71 operations for hernia, 10 for penetrating wound of the abdomen, 63 for liver abscess, 1 for abscess of spleen, 2 on kidney, 7 cystotomies, 41 lithotomies, 2 lithotrites 53 lithotaxies, 2 ovariectomies 231 obstetric operations of all sorts

In the matter of treatment, the present Superintendent is trying chalmugra oil in gradually increasing doses. A new treatment of apparently some promise has just been introduced by Professor Deycke of Constantinople (*British Medical Journal* of 4th April 1908, pages 802 and 827), who has asked the British Government for permission to try it in some of the British colonial leper asylums

The Superintendent suggests that a strict rule regarding the retention of lepers in the asylum should be made to the effect that no leper should be discharged unless he is certified to have been free from ulceration in the asylum for a period of at least one year. If this were done, he says, and if those lepers who are seen begging at large with open sores were sent to the asylum, the chances of the spread of leprosy would be diminished

Calling of hospital assistants to headquarters—Some civil surgeons take an interest in their hospital assistants and assist them by questions, instruction or demonstration when they are stationed at the sadr or are visited in the course of the civil surgeons' tours. But Captain S. Anderson and Captain McCoy improved upon this by calling in their most useful subordinates from time to time for a short practical training at the sadr dispensary. This is a thing to be encouraged, and it is easily done when a supernumerary is available or other temporary arrangement can be made

Asepsis and antiseptics—Hospital assistants all round have been stirred up as to their practical knowledge and use of asepsis and antiseptics, and many of them have provided themselves with Major Newman's book on the subject

Supply of the Indian Medical Gazette to hospital assistants—In the Triennial Dispensary Report for 1902-04, I suggested the advisability of supplying the *Indian Medical Gazette* to hospital assistants to help them in keeping up with the constant additions made to medical knowledge by scientific and professional research. Government approved my proposal, and accordingly 23 copies of the journal are being supplied to the civil surgeons of Assam for circulation among the hospital assistants. It is for civil surgeons on their part to see that the circulation is actually carried out regularly and not neglected, and if a hospital assistant wishes the *Gazette* and does not get it, he should write to his civil surgeon and ask for it

School courses for hospital assistants—Government having approved the suggestion made in the Triennial Dispensary Report for 1902-1904, three hospital assistants were sent to the Dibrugarh Medical School for training in all subjects as they had failed several times to pass or go up for the departmental examination. All passed subsequently. Two other hospital assistants were sent to the Medical School at Dacca for a course of training in Medical jurisprudence, one because he had been found defective in the subject, and the other to qualify for holding charge of a subdivision

X Ray instruction—Complete X ray apparatus having been sanctioned for the Dacca and the Dibrugarh Medical Schools, three assistant surgeons and one hospital assistant were sent from this province to Dehra Dun for instruction in the use and management of the apparatus. All passed the examination at the end of the course, Assistant Surgeon Satis Chandra Ghosh, of Jamalpur, with credit. The hospital assistant is the Senior Demonstrator of Anatomy, Dacca Medical School

Departmental Examination—During 1907, a new set of rules for the departmental examination of hospital assistants was drawn up, the main features being the increased stress laid on practical work and the encouragement of English. Since the close of the triennium the rules have been again revised in consequence of a communication received from the Government of India, the chief differences being the abolition of pure anatomy as a subject, the abolition of a formal separate oral examination, the making the examination in certain subjects practical only and not written, general increased stress on practical and clinical work as opposed to written, and the note that questions are not to be so difficult as in a licence examination

Language allowance to hospital assistants and compounders—In 1905, with a view to improving the efficiency of the medical service in the hill districts of Assam, Government approved a proposal to grant an extra allowance of Rs 10 per mensem to a hospital assistant employed in a hill district not being a native of the district who is certified by the Deputy Commissioner to be able to make himself understood by the people of the locality, and I have been authorized to grant such language allowance. At present seven hospital assistants are drawing this allowance. In 1907, a similar concession of a grant of Re 1 per mensem was made in the case of a compounder serving in the Lushai Hills, who is not a native of the district. At present six compounders are getting such allowance.

In this triennium the largest number of surgical operations were performed in Sylhet (31,036), Mymensingh (24,322), Dacca (22,157), Bakarganj (21,997), Tippera (17,499), and Fardpur (15,132) districts

A marked rise in the number of surgical operations during the last year of the triennium in comparison with the second took place in the districts of Mymensingh (8,554 against 7,908), Goalpara (1,875 against 1,331), Dacca (7,838 against 7,364), and Fardpur (5,160 against 4,810). The most noticeable decrease took place in the Tippera district, 5,457 against 6,073

The number of **SELECTED OPERATIONS** fell off considerably, being 2,509 in 1907 against 3,019 and 2,676 in 1906 and 1905, respectively. This fall was chiefly due to the exclusion from the list of such tumours as were not bigger than a walnut

There was a marked decrease in the number of selected operations in the province in the present triennium as a whole 8,501 in this triennium against 9,153 in the last, because medical officers were instructed not to show the putting up of simple fistulas, incisions into the peritoneum, punctures of membranes, and tumors not bigger than a walnut in the selected list. The case mortality of selected operations was 2.74 per cent in 1907, 3.28 in 1906, and 2.84 in 1905

The following officers performed the largest numbers of selected operations during the last year of the triennium—

Captain H. A. J. Gidney, Dinagpur, Rajshahi, and Goalpara 341, including 263 cataracts, Major A. R. S. Anderson, Rajshahi and Dacca (156 including 92 cataracts), Lieutenant Colonel R. M. Campbell, Dacca (91, including 38 cataracts, in six months and a half), Captain T. O. Rutherford, Mymensingh and Nagri Hills (77, including 16 cataracts), Captain L. B. Scott, Cachar and Kamrup (51, including 18 cataracts), Captain O. St. J. Moses, Goalpara and Bakarganj (49, including 8 cataracts), Lieutenant Colonel E. A. W. Hall, Chittagong (48, including 21 cataracts)

Amongst the assistant surgeons may be mentioned Rajani Kanta Das Gupta, Sheikh Elahi Baksh, Lalit Mohan Roy, Basanta Kumar Bhownik and Gopal Chandra Chatterjee, who performed 99, 55, 46, 32, and 31 selected operations, respectively

Hospital Assistants Bishnu Charan Bannerji, Dwarka Nath Shome, Prasanna Kumar Purkayastha, and Guru Nath Son, respectively, performed 41, 25, 24, and 23 selected operations

The statement given in the margin shows at a glance the details of admission and discharge. The total treated was the same in 1907 as in 1906 and greater than in 1905, but the average annual strength was less in 1907 than in either of the other years. Of the 21 lepers admitted in 1907, 18 were Hindus 6 Muhammadans, and 2 of other castes, 13 cases were of the tubercular and 13 of the anesthetic variety. The number of deaths was the same in each year of the triennium. Of the six lepers who died in 1907, four were of 50 years and over, and two of 30 and over, and death was mostly due to exhaustion from the disease with advancing years, though one died of cirrhosis of the liver. One died after only four days in the asylum and another after a stay of only three months. There remained three criminal lepers in the asylum at the close of the year 1907. Exclusive of establishment charges the total expenditure for the year was Rs 1,595 against Rs 2,023 in 1906, and Rs 1,569 in 1905. As stated in last year's report, the greater expenditure in 1906 was due to the extraordinarily high price of food stuffs. The average cost of each diet in 1907 and in 1906 was Re 0.34 as compared with Re 0.26 in 1905. The average cost per diem in the last two years was 8 pices more than the minimum laid down by Government

SYLHET LEPROSY ASYLUM

YEAR	Remaining from previous year	Lepers admitted	Relatives admitted	Total	RESULT			Remaining on the last day of the year	Daily average of lepers treated
					Discharged cured or relieved	Discharged otherwise	Died		
1	2	3	4	5	6	7	8	9	10
1905	14	13		32	5	5	6	16	19.13
1906	16	32		48	15	19	6	21	21.15
1907	21	26	1	48	9	16	6	17	17.05

III

HOSPITALS, UNITED PROVINCES

THIS is the first Triennial Report submitted by the Hon'ble Colonel R. D. Murray, M.S., the Inspector General of Civil Hospitals of the United Provinces.

There has been an increase OF 13 DISPENSARIES in the three years, but more are needed and the Government has agreed to give grant in aid and loan of medical subordinates to the Salvation Army who have offered to co-operate with Government in the matter of medical relief. In a couple of cases local Dufferin hospitals have been in trouble but have recovered.

The large INCREASE IN attendance points clearly to local popularity of the dispensaries. We quote the following remarks by Colonel Murray on the surgical work, for which the hospitals of this province have ever been famous: "The number of SURGICAL OPERATIONS performed during the year 1907 was 193,824 against 188,572 in 1906 and 181,346 in 1905, the number of patients operated on increasing from 178,289 and 182,072 to 186,888. The increase is satisfactory. A gratifying feature is that although the number of operations and patients increased the number cured rose also from 161,713 in 1905 to 166,670 in 1906 and 171,694 in 1907. With 5,252 more operations and 4,816 more patients operated on in 1907 than in 1906, there were 5,024 more persons cured in 1907. With the large increase the number of deaths was only 65 above that in the previous year.

The general advance is matter for congratulation. It is due in large measure not only to the increasing confidence of the people and to the extended scope which medical officers enjoy under modern surgical procedure, but also to the stimulus which has been given to operative work by the improvement to operating rooms and surgical equipment during the past few years. My predecessor, Colonel Joubert, commenced a campaign against obsolete instruments and obsolete methods which is now beginning to bear fruit, and I have done my best to continue the good work by building new operating rooms and removing defects from old ones wherever it has been possible. There is hardly an operating room in these Provinces which has not been either rebuilt or remodelled during the past three years or for which structural alterations have not been proposed. My work in this direction has unfortunately been stopped temporarily by the necessities of the existing famine and all projects are in abeyance. Operations are now possible in our larger hospitals which a few years ago were not undertaken at all or, if so, with the greatest apprehension. The triumphs of modern surgery which can only be achieved by attention to that complete asepsis which can alone ensure success, and which was impossible under the old conditions. Not only Civil Surgeons but Assistant Surgeons now undertake formidable abdominal and other operations with success which formerly was precluded on account of the dirty surroundings under which they had to be performed.

The annual grant of Rs. 25,000 for the improvement of sadar hospitals has enabled me to carry out my schemes of reform, and I trust it will be continued until all necessary projects are completed. I wish here to express my acknowledgment for the hearty co-operation which has been accorded to me by local authorities, and the readiness with which district boards have accepted and carried out my recommendations.

Among Indian Medical Service officers those who have done most work during the triennium are Lieutenant Colonel J. J. Pratt, Major G. T. Birdwood, Lieutenant Colonel J. Anderson, Major C. Milne, Lieutenant Colonel R. J. Marks, Captain E. J. O'Meara, Lieutenant Colonel Sweeney, Lieutenant Colonel J. M. Cadell, Major Austen Smith and Lieutenant Colonel Woodwright. Major Austen Smith was present during 1907 only in which year he stood second on the list. As regards Lieutenant Colonel Pratt and Major Milne about 50 per cent of their cases consisted of radical cure of hydrocele which is very prevalent at Fyzabad, while Major Crawford, Major Birdwood, Lieutenant Colonel Anderson and Lieutenant Colonel Marks did most general surgery. Lieutenant Colonel Woodwright performed 435 cataracts and 53 lithotomies in 1906 and 1907, which is good for Aligarh. Major Crawford out of a total of 1,562 operations in the three years did 1,015 cataracts, 5 cases of abscess of the liver, 55 lithotomies, 33 litholapaxies, 1 excision of the rectum, 12 herniotomies, 19 cataracts, 14 external urethrotomies and 185 operations for radical cure of hydrocele. This is a fine record. It is difficult to single out individuals where many have done so well, but Major Crawford's work has been specially meritorious. Lieutenant Colonel Cadell and Lieutenant Colonel Marks, who were stationed in "stone" districts, performed the larger number of stone operations. The former did 130 litholapaxies and 14 lithotomies and the latter 124 and 10. As regards cataract Major Birdwood heads the list with 1,106 cases, Major Crawford comes next with 1,015 and Lieutenant Colonel Sweeney third with 636. Then follow Lieutenant Colonel Pratt (635), Lieutenant

Colonel Anderson (554 in two years), Captain O'Meara (531), Lieutenant Colonel Marks (524), Lieutenant Colonel Woodwright (435) and Major Austen Smith (411 in 1907 alone, the largest number performed by any officer during that year). A noticeable feature has been the increase in abdominal surgery. During the three years Major Birdwood did 44 abdominal sections, Lieutenant Colonel Pratt 22, Major Milne 22 and Major Austen Smith performed 24 during 1907 alone.

Among Indian Service Medical Department officers Lieutenant Hogan heads the list during 1907 with 182 operations.

Assistant Surgeon Sripal Sahai, Rai Bahadur, performed 644 operations during 1907 at Benares, of which 248 were for cataract, and Assistant Surgeon Balbhadar Singh did 378, of which 249 were cataract cases. The next four in the list are—

S. K. Mukerji	266
Muhammad Abdul Rahim, Khan Bahadur	258
Rajendra Nath Abudhuri, Rai Bahadur	248
Ranjit Singh Saini	211

Lady Doctor Miss J. George of Benares performed (during 1907) 72 operations, Miss Bonner of Allahabad 71 and Miss Hetherington of Agra 70. Of these 34, 57 and 40 were obstetric cases. There was also much surgical activity in the Duffins at Fyzabad and Cawnpore where Miss Clara Singh and Miss Lerch enjoy a wide reputation.

The urgent need of the Province is still MORE HOSPITAL ASSISTANTS. On the 1st January 1905 there were only 362 against a sanctioned strength of 416, and the year 1907 closed with 395 out of a total of 435. This unsatisfactory state of affairs is no doubt due to there being, up to very recently, accommodation for only 50 students yearly at the Agra Medical School and to the fact that military students are educated at the school at the cost of these Provinces for military duty, and that Rajputana and a few private students are admitted thus absorbing the available accommodation. In order to remedy this the school has been enlarged to the extent of 25 admissions, but the tension, notwithstanding, will not be relieved for some time. With a staff so much below the sanctioned strength it has been difficult in ordinary years to replace even casualties from deaths, resignations, dismissals and superannuation. Leave for men of this class has practically been closed for a long time. When in addition heavy demands are made for cholera, mela and famine duty the resources of the department are very severely strained. I am glad to report that notwithstanding the fact that there have been between 40 to 50 men short in our cadre, the work has never suffered and all requisitions have been met, although the period under review has been a specially strenuous one for the department.

In 1905 the students of the Agra Medical School and the civil hospital assistants attached to dispensaries petitioned regarding their status and prospects and the memorials were forwarded to the Government of India in 1906. Intimation has recently been received that when the replies from all Local Governments are received, the Government of India will lose no time in dealing with the question. I see no reason why hospital assistants in the military branch should be in a better position than those on the civil side. Most of the civil hospital assistants are heads of dispensaries in independent charge and have a responsible position. They have all to pass the entrance or school final examination before they can be admitted to the medical school, and have to undergo a four years' course in medical training before they can be recruited into the service. Men who are familiar only with the vernacular are not recruited. This condition does not exist in the military branch.

The existing RATES OF PAY FOR CIVIL HOSPITAL ASSISTANTS are inadequate with reference to their responsibilities, their training and the pay in other departments. It will be an incentive to this deserving body of men if the rates of pay are increased as recommended by me in 1905. The revision of allowances attached to the charges held by civil hospital assistants is still under consideration. From April 1906 special allowances were sanctioned to hospital assistants serving in dispensaries situated in the hills, and in order to encourage medical education among hill youths special facilities such as stipends, travelling allowance and some relaxation of the Agra Medical School rules have been sanctioned. The concessions have been extended to 20 candidates to be admitted as noted below during the five years commencing with 1906. The six hill pupils admitted in July 1906 from the Narni Tal, Garhwal, and Almora districts have done fairly well so far and will be infinitely better than plains men for hill appointments.

1906	6
1907	6
1908	5
1909	4
1910	3
	2

In 1905 Government sanctioned an increase from 20 to 45 in the number of scholarships granted at the Agra Medical

School Three resident civil hospital assistants were appointed to the school in the same year. The appointments are filled by the best of the newly passed men every year. They serve for four months each in the medical, surgical and eye wards. The necessity for an extra appointment in the surgical out-patient department has been represented, and the necessary Government sanction will, I hope, be received shortly. There will then be four men who will devote three months to each department. The experience thus gained will be of inestimable value to them in their future career.

The Inspector General gives a list of the medical men who have succumbed during the three years a heavy toll. Showing the risks of the profession a matter which as Colonel Murray says, is too frequently lost sight of.

The following note on the new Medical College at Lucknow now being built is of great interest —

On the 26th December 1905 His Royal Highness the Prince of Wales laid the foundation stone of the NEW MEDICAL COLLEGE AND HOSPITAL which is to be the permanent memorial of the visit of the Prince and Princess to the United Provinces. The project for this large and important undertaking is well advanced and the construction of the building will soon be commenced. A rough preliminary estimate amounting to Rs 30,19,563 was submitted to the Government of India in August 1907. This included the main college and hospital buildings, professors, students and servants' quarters and electric, water supply and sewage disposal installations. The report of the Architect, Sir Swinton Jacob, has been received and from the photographs of the designs which it contains the whole scheme will constitute a very noble pile of buildings in the Indo Saracenic style. The following statement shows an abstract of the estimated cost of the different buildings —

	Rs
Hospital	12,30,802
Dispensary (out door)	1,56,507
Cottage and Isolation Wards	1,81,448
College	6,41,334
Hostel	4,11,878
Residences	1,96,278
Roads, gates, fencing, &c	1,20,984
Miscellaneous	1,98,370
Fittings	2,00,000
Electric plant	2,35,950
Water, drains, &c	1,76,448
Total	37,49,999

The following remarks on the antiplague campaign are of interest —

It has been established beyond a doubt that inoculation with Professor HAFKIN'S VACCINE is the most valuable form of protection against plague. It confers almost complete immunity for a period varying from six months to a year, the immunity subsequent to this becoming gradually less and less, though some trace of it remains even after five years. Moreover it ensures recovery to the few who contract the disease after operation if performed before the individual becomes infected. During a violent epidemic it will always happen that a certain number of people may have the seeds of the disease in them at the time of inoculation and when the disease develops this discredit is cast upon the method, but even in such persons the disease usually runs a milder course and recovery takes place.

In the autumn of 1907 arrangements were inaugurated for inoculation operations on an extended scale throughout the Province the goal aimed at being the provision every where of facilities for inoculation within a reasonable distance of the homes of those who seek it. A special service to carry on the campaign was organized. Major Chatter Whitto as Chief Plague Officer and Captain Band as Assistant Plague Officer were placed in charge of the operations in different parts of the Province, assisted by a staff of trained inoculators composed of —

- (1) Assistant Surgeons in charge of dispensaries
- (2) Special Health Officers on plague duty
- (3) Assistant Health Officers in Municipalities
- (4) Lady Doctors for work in zemindars
- (5) A peripatetic staff of temporary Assistant Surgeons for carrying on work in villages

The issue, free of cost, of the necessary apparatus and vaccine to private medical practitioners of proved competency was sanctioned, and the services of eight Indian Medical Service officers were placed at the disposal of this Government by the Government of India for employment in the chief cities of the province. Officers of the Indian Army were also employed in the same towns for the purpose of directing the operations of the destruction of rats &c. The following figures show the seizures and deaths during the four months—November to February—of the present season as contrasted with the corresponding period of the previous year.

	Seizures	Deaths
November 1907	785	609
December 1907	1,611	1,402
January 1908	2,676	2,447
February 1908	4,897	4,268
	9,969	8,726
November 1906	4,010	3,434
December 1906	9,149	8,211
January 1907	19,598	17,677
February 1907	32,414	29,050
Total	65,171	58,372

This is so far very satisfactory. During the year 1907 there were 34,169 inoculation operations performed in districts. Bareilly registered 5,076 Ghazipur 4,216, Ballia 3,397, Azamgarh 2,860, Moradabad 2,624 and seven other districts over 1,000 each. From 1st January 1908 to 29th February, 24,258 persons have been inoculated, and of these about 8,000 were done in Lucknow and its neighbourhood alone under the active campaign carried on by Captain H. W. Illus, I.M.S. the Special Plague Officer.

It is satisfactory to be able to state that not a single casualty has been reported as a result of the inoculation operations which is a proof of the success of our precautionary measures to guard against such a contingency. During the six months ending 29th February 1908, 1,387,955 rats have been killed throughout the Province.

We must, for lack of space, omit Colonel Murray's notes on the medical arrangements in the FAMINE and SCARCITY districts and on LEPROSY ASYLUMS. We note with interest that use is being made of the X-ray institute for the treatment of leprosy. The SNAKE BITE LANCETS of Leonard Rogers, generally called the Sir Lander Brunton lancets, are also used. Colonel Murray rightly protests against the prohibitive price charged for antivenereal serum by the Kisanli Institute, a price of £120 per tube makes it very difficult for rural dispensaries to stock the necessary serum.

We note that 17 cases of BERTI BERTI were recorded in Bisti District, — were these born here or the epidemic dropsy so prevalent in eastern part of the Bengal Presidency? This report should be published with the results of the trial of food stuffs in the Gorakhpur jail.

Civil Surgeons of other provinces will note that at last the pay of those hard worked men, the CIVIL SURGEONS' CLERKS, has been improved —

In 1905 Government recognised that the clerical establishment in Civil Surgeons' offices required reorganization and instead of the dual authority previously exercised by the Inspector General and Sanitary Commissioner it was decided to do away with separate mortuary clerks as such under the Sanitary Commissioner and to have all the clerks under the control of the Inspector General.

Three grades of clerks were sanctioned, viz —

- (1) Rs 30—50 by triennial increments of Rs 4
- (2) Rs 20—30 by annual increments of Rs 2
- (3) Rs 15—20 by annual increments of Rs 1

It was also suggested that a second clerk should be allowed in districts where at present there is only one but this was not approved by Government. It is very difficult to manage in such offices as the clerk gets few or no privileges such as holidays or casual leave and there is no under study in the case of illness.

The above scheme came into force from 1st March 1906 and the service made pensionable. This latter concession was much appreciated and the former discontent has passed away. There is so much of general interest in this valuable report that we have but little space left for any notice of individual surgical operations, but we must quote the statistics for STONE IN THE BLADDER —

By lithotomy —

Suprapubic	44 cases,	3 cured,	8 died,	3 remained
Lateral perineal	321	228	31	11
Median perineal	43	38	3	1
Vaginal	5	4	1	—
By lithotomy	32	22	7	—
By litholapaxy	673	634	29	5

We congratulate Colonel Murray on a report of unusual interest and a record of good work in medicine and surgery and of decided general progress.

PUNJAB

THE Triennial Report of the Punjab Hospitals for 1905, 1906, 1907 is submitted by Colonel T. E. L. Bate, I.M.S., C.I.E.

The total number of hospitals and dispensaries is 425, compared with 371 of three years ago. Many districts, however,

are still inadequately supplied. We quote the following extract from the Government Resolution on the Report —

The citizens of Jhang have shown their public spirit in contributing Rs 6,221 to their hospital, and in Lyallpur the people have also helped usefully. It is satisfactory to see that those who have prospered by the wealth of the canal colonies are beginning to recognise their obligations. There is no few charitable objects upon which money can be more profitably expended than the dispensaries and the Lieutenant Governor hopes that the Indian public will gradually come to realize this. Now that arrangements have been made for enabling subscribers to earmark their subscriptions for particular objects and particular dispensaries, each subscriber will be able to see for himself the good he is doing to his fellow men, and it may be that the personal pride in an institution which he has helped to develop will open the purse strings of many who have hesitated to give what has hitherto been really a mere donation to the funds of the district board, a body to which no particular sentiment can attach. It is by private subscription that the better classes who use the dispensaries can show their gratitude for the benefits received.

The following extracts are of special interest —

Surgery was over a strong point with Civil Surgeons in the Punjab and the following shows how well the reputation of the province is being kept up —

SURGICAL OPERATIONS, which numbered 180,408 in 1905, rose to 192,643 in 1906, but declined to 189,995 in 1907. The decrease is generally ascribed by civil surgeons to the unprecedented epidemic of plague that desolated the province last year. The figures include a large proportion of minor operations, extraction of teeth and evacuation of abscesses account for 91,647 and 50,516, respectively, of the total for last year. Compared with 1906 there was a decrease of 1,640 at Jullundur, 493 at Gujranwala, 310 at Karnal, 267 at the Mayo Hospital and smaller numbers at other places. On the other hand, some hospitals show an increase, which amounted in the cases of Rawalpindi and Ambala to 434 and 432, respectively.

Selected operations, which numbered 17,701 in 1905, rose to 19,421 in 1906 and to 19,375 in 1907, giving an average of 18,899. At the Jullundur hospital 2,854 were performed in 1907, as compared with 3,506 in 1906 and 3,115 in 1905, the decrease last year is ascribed by the civil surgeon to the plague epidemic. A great deal of operative work was also done at Amritsar, Lahore and Simkot, and special mention should be made of the Moga dispensary, in the Ferozepore district, which returns as many as 682, and of the Kasim dispensary, where 444 were performed.

There were 7,683 **OPERATIONS FOR CATARACT** in 1905, 8,010 in 1906 and 7,577 in 1907, the percentage of good vision obtained being 93.88, 92.82 and 93.53, respectively. The largest number in each year of the triennium has been done by Major H. Smith at Jullundur, who draws patients from a very wide area. This officer has an unrivalled experience and, as might be expected, he returns the best results. Next to Major Smith in this field comes Hospital Assistant Mathura Das, who has also established a great reputation for himself as an operator on the eye, and the fact of his work being progressive speaks well for the way in which he does it.

There were 1,987 operations for removal of **STONE IN THE BLADDER** in 1905, 2,405 in 1906 and 2,390 in 1907. The Multan Hospital returns 210, the Mayo Hospital coming next with 128 and the Montgomery Hospital third with 110. Lithotomy was done in 199 cases in 1905, in 223 in 1906 and in 261 in 1907. The percentage of deaths has been 9.54, 15.24 and 10.34 respectively, giving an average of 11.71 as compared with 9.44 in the previous triennium. It is impossible to say, without full enquiry, to what causes the high death rate in 1906 is ascribable. It is interesting to note that the surgical operation was performed more frequently during the period under review than in the previous triennium, the numbers being 131 and 51, respectively. Assistant Surgeon Bharat Chandra Ghosh, in charge of the Lyallpur hospital, has recently removed a stone weighing nine ounces by this method the patient making a good recovery. The difficulties of satisfactorily scrutinizing results are greatly enhanced, owing to all operations, from extraction of teeth to equipment ovariotomy, being recorded in the same register. The surgical being deficient in some hospitals, lithotomy had to be performed instead of litholapaxy.

LITHOTRIPSES AND LITHOLAPAXIES numbered 1,783 in 1905, 2,165 in 1906 and 2,086 in 1907, giving an average for the three years of 2,011.33. The mortality was 2.19 in 1905, 2.95 in 1906 and 2.73 in 1907, or an average of 2.62 against 2.73 for the previous triennial period. It will be hardly necessary to say that litholapaxy is the operation which offers the greatest advantages and it ought of course, to be performed in preference to any other for the removal of stone. But, unfortunately, it cannot be undertaken in certain cases and the instruments required for use on small children are not available in all hospitals. Assistant Surgeon

Bharat Chandra Ghosh removed a stone by this method last year, weighing thirteen ounces.

Among other **IMPORTANT OPERATIONS** performed last year may be mentioned ninety for hernia, with eight deaths, seventy-five abdominal sections, with sixteen deaths, twenty-six ovariotomies, with five deaths, seventeen Cæsarean sections, with eleven deaths and fifty-eight for abscess of the liver, with nine deaths. Five ovariotomies were performed in St. Stephen's Mission Hospital, Delhi, with two deaths, four in the Lady Aitchison Hospital, with no death, four in the Mayo Hospital with three recoveries, the fourth case being still under treatment at the close of the year, and four in the Jullundur Hospital, with two deaths. Altogether, a great deal of very excellent work was done during the triennium, which it may be confidently anticipated, from the published records of the last two years of the period, will compare favourably with what has been accomplished in other provinces.

Most civil surgeons are satisfied with the **SURGICAL EQUIPMENT** at their disposal in head quarters hospitals and it is being amplified from year to year. But the operating rooms in some hospitals are very far from what they ought to be and their furniture is little if at all better, in this respect there is a great deal to be done, advance being slow, owing to the difficulty experienced in getting funds to meet necessary outlay. Great improvements have, however, been made during the past few years in this direction at Delhi, Ambala, Ludhiana, Multan, Ferozepore and Lyallpur. At the last mentioned place, Captain M. Corry and Assistant Surgeon Bharat Chandra Ghosh succeeded in raising a sufficient sum from private contributions last year to cover the cost of an operating table, glass cases for instruments and several other modern appliances, and there is no reason why similar energy and zeal should not meet with equal success elsewhere.

The officers who distinguished themselves by their surgical work, in the last two years of the triennium, have been mentioned in the reports for 1905 and 1906, so a reference will now be made to those only who did the largest number of important operations last year. Major H. Smith performed 2,833, Major E. V. Hugo, 480, Lieutenant Colonel T. R. Mulhoney, 441, Lieutenant Colonel H. Hendley, 259, Lieutenant Colonel A. Coleman, 238, and Lieutenant Colonel F. F. Peary, 207. The last mentioned officer was absent for six months of the year. Among Assistant Surgeons, the following did the largest number — Lal Hari Chand, 454, Lala Sri Ram, 142, Lala Har Narayan, 323, Lala Girdhari Lal, 309, Lala Thakur Das, Rai Bahadur, 289 and Lala Brij Nath, 253. Hospital Assistant Mathura Das, who is in charge of the dispensary at Moga, in the Ferozepore district, performed 667, Senior Hospital Assistant Naraj Shrivastava and Hospital Assistants Bal Mukund and Shyam Das are also entitled to commendation for their operative work.

The following remarks are of special interest — "Here, it may be noted that the Punjab Government has recently sanctioned a certain number of medical officers being deputed each year to visit the medical institutions in other provinces, so as to afford them an opportunity of acquainting themselves with what is being done in the medical field elsewhere. It is hoped that in this way many fresh ideas will be obtained, which will give the way to further advancement."

Similarly, the Local Government has granted facilities enabling assistant surgeons, desirous of improving their knowledge of modern methods, to visit the Medical College and Mayo Hospital. Several of these officers have already availed themselves of the privilege, which is certain to be generally appreciated.

Another scheme approved by Government provides for hospital assistants in charge of outlying dispensaries being deputed to head quarters hospitals for a period of two months, to refresh their professional knowledge. This arrangement is being tried in several districts and it promises to yield satisfactory results. In this connection it may be noted that provision has been also made for the supply of sound medical literature to hospital assistants, in the hope that they will be encouraged to keep themselves abreast of the times. These measures have been taken as the best available circumstances making it impossible to establish post graduate courses at present.

The provincial medical library, established in 1906, now contains an excellent collection of recent editions of books of recognised merit, which can be obtained on loan by civil surgeons and assistant surgeons. Officers take advantage of the means thus placed within their reach to keep themselves informed of the progress made in medicine and surgery."

BURMA

THE Triennial Report on the Burma hospitals and dispensaries is submitted by Colonel Fleuchman, the officiating I G of Civil Hospitals.

We make the following extracts —

Plans for the provision of OPERATION ROOMS to meet modern requirements as far as possible within the limits of expenditure permissible by funds were furnished for fifteen institutions, of which three are under construction. Contributions were made by Government towards constructing operation rooms at Henzadi, Prome and Kyaukse. Mansfield's oil gas installations were sanctioned for the operation rooms at the Bassein and Prome Civil Hospitals and have just been completed. Specially designed windows for these operation rooms are being obtained from England.

An operation room fitted with oil gas installation and plenum ventilation was constructed and is at present used at the Rangoon General Hospital, the old operation theatre being converted into a room for X Ray apparatus.

A complete SCHEME FOR PROVINCIAL LABORATORIES has been submitted to Government for approval. With the sanction of Government and funds placed at the disposal of the Inspector General of Civil Hospitals, an experimental laboratory with a Mansfield's oil gas installation was started at Maymyo in a rented building and handed over to the control of the Sanitary Commissioner for the cultivation of *Dansy* virus and other matters connected with plague preventive measures. Special Nursing Wards for the New General Hospital at Rangoon and the building for the Shore Dispensary at Mandalay were completed. These buildings are specially designed and are circular in shape. Other buildings of importance in progress and nearing completion are the Princess of Wales' Ophthalmic Ward at Mandalay, improvements to the Maymyo Hospital, the Lady Minto Nurses' quarters at Rangoon and Maymyo and the New General Hospital, Rangoon.

SNAKE BITES—Colonel King's attention having been drawn to the great mortality from snake bite among the people of this Province he advocated the introduction of Sir Lauder Brunton's Lancets for the immediate treatment of snake bite with Permanganate of Potash. The Local Government having sanctioned the free distribution of these Lancets, 1,500 lancets with leaflets in English and Burmese containing directions for use were sent in the beginning of 1907 to Commissioners of Divisions for distribution to select *Myyothugys*, Village Headmen, Revenue Surveyors, Police Officers, Vaccinators, Veterinary Inspectors, Township Officers and Hospital Assistants. A few reports have been received from the Sagaing and Irrawaddy Divisions of successful treatment.

The total number of Surgical operations performed during the past year was 27,206 against 25,893 in 1906 and 24,536 in 1905. The total increase in the triennium was 7,859. Amongst the patients operated on, the annual death rate was 8 per cent against 74 per cent in 1906 and 36 per cent in 1905, and the rate per cent of the triennium was 64 against 51 in 1902-04.

Excellent SURGICAL WORK was done during the triennium under report as testified by the marked yearly increase in number of major operations enumerated below —

Nature of operations	1905	1906	1907
Amputations	113	152	204
Trephining the skull	52	59	53
Laprotomy	35	68	78
Cataract extraction	31	37	56
Insectomy	22	34	12
Excision of eye ball	22	14	30
Hemiotomy	62	61	85
Abscess of liver	12	13	20
Lithotomy	16	20	21
Lithotripsy	5	6	20
Litholapaxy	22	23	10
Oophorectomy	11	3	5
Ovariectomy	7	1	11
Hysterectomy	3	6	13
Excision of vermiform appendix	2	14	19

The number of operations performed does not compare favourably with that in Indian Provinces and the subject was amply indicated upon in the previous triennial report, but this is not due to any want of zeal or skill on the part of Medical Officers as testified by the nature of operations performed. Medical Officers in this Province are just as keen and skilful as their brethren in Indian Provinces whose work is much easier because it is amongst people who have been longer under British rule and are therefore more conversant with the advantages of Western Surgery which they readily avail themselves of, and because unlike Burma their subordinate staff comes from the same class as the people themselves who are readily persuaded by them to submit to operations. The OPENING OF EYE AND MATERNITY HOSPITALS at Rangoon and Mandalay, under the Government is suggested by my predecessor in his last year's Note, will no doubt give a great incentive to surgical work in those two special departments as there is a wide field for such work.

The hospitals in which most surgical work was performed during 1907 are Rangoon, Mandalay, Moulmein, Thayetmyo and Bassein. At the General Hospital, Rangoon (where the highest number of surgical operations have been performed every year), there has been an increase, viz., 4,018 in the past year against 3,053 in 1906 and 3,500 in 1905.

The officers who performed most important surgical work were Lieutenant Colonel Evans, I M S, Majors Bailey, Penney, Rost, Hammond, Stoddart and Dee, I M S, Captain Bent and Good, I M S, Military Assistant Surgeons Hefferman and McCarthy and Dr. Frick.

During the triennium three appointments for superior grades of Medical Officers were added, namely —

(1) A Sanitary Commissioner for the Province for an Indian Medical Service Officer, (2) A second class Civil Surgeoncy at Lomwe for an Officer of the Indian Medical Service, (3) A second class Civil Surgeoncy for the Hanthawaddy District to be held as found convenient by any superior class of Medical Officers.

MUCH DISCONTENT EXISTS among officers of the Indian Medical Service in the Province owing to the repeated disappointments year after year in the matter of leave. The cadre being small the reserve for leave vacancies is limited and when officers once on leave obtain extensions on Medical certificate from time to time, the grant of ordinary furlough to those who have earned it is not possible with the result that after sticking loyally to their posts, they eventually break down in health and have to be invalided on sick leave. Representations were made last year on the subject and it is hoped that before long a system will be introduced by which the Province will not have to depend on its own resources to fill leave vacancies and officers will be able to get away on leave in time before their health breaks down.

During the triennium three Indian Medical Service officers in addition to the sanctioned cadre were continuously employed on plague preventive measures.

General Hospital, Rangoon—Several additions and improvements were made in this institution most important being the new operation room. The nursing staff and the menial staff were increased to meet requirements. There was a falling off in in-door female patients. The attendance of Burmans both in and out has also decreased which is very disappointing especially as regards in-door because in 1907, the wishes of Burmans were specially considered by reserving space for them two wards which were well equipped with books, papers and games through the generosity of Mr. Kway Sit Pwa, Mr. Suk and Mr. Kway Ea Thak. A Burmese cook was also entertained. The Civil Surgeon is inclined to attribute this decrease of in-patients to some change in the native population of Rangoon, and of out-patients to the opening of dispensaries in Kienumendine and Pazundung.

In out-patients, eye and ear cases show a steady increase probably due to the opening of special eye and ear departments in the afternoon at the Hospital.

Pathological Laboratory—With a small laboratory some pathological work was performed at the Rangoon General Hospital, but there is a great need of a well equipped and staffed Pathological Laboratory in Rangoon and it is to be hoped that the recommendation for building one in connection with the New General Hospital, Rangoon, made by Colonel King, will receive favourable consideration.

Correspondence.

I M S PENSIONS AND PAY.

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR—I am very glad to see you have been raising the question of intermediate or earlier pensions, the officer who spent his time at his own expense taking higher degrees before entering the service, already is at a considerable disadvantage. The rules regarding advanced promotion to Major and to Lt Colonel have accentuated this, ignoring as they do all degrees taken before entering the service.

In this country at least the I M S is also very badly paid. Under various reorganisation schemes we receive less pay than forest, police or even veterinary services, much less if our later age on entry is allowed for.

The deduction of Rs 50 on entering civil employment is, I believe, universally felt in most places here, private practice does not make up for this.

A further point, with which perhaps all provinces will not agree, is the reservation of special appointments to any one province.

Yours, etc.,

BURMA.

THE BITE OF ECHIS CARINATA

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—I would be much obliged for any information from your numerous readers regarding the symptoms following the bite of the species of snake known as the "Echis Carinata" and the treatment most likely to be useful in these cases. In asking for this information I have a recent case in mind where all the initial symptoms commonly met with in snake poisoning were absent for thirty six hours, and the patient was reported to be quite comfortable, but after this time, bleeding from mucous surfaces took place, the patient eventually dying on the 7th day from symptoms of sanguineous apoplexy. In this case "Antiveneno" was injected a couple of hours after the bite. I have been given to understand that "Antiveneno" is not suitable in this form of poisoning. I would be favoured if you would insert this letter in the next issue of the Indian Medical Gazette.

Yours faithfully,

C A OWEN, F.R.C.S.,

LHUT, I S M D

LAHORE

TREATMENT OF PNEUMONIA

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—While agreeing with Major McI Smith to a large extent on the treatment of pneumonia, I consider that a total disregard of the facts of pathological anatomy and the physical signs on the part of a practitioner as he recommends would lead to but half treatment of his cases. Granted that the disease is a toxemia, yet that postulate should not make us oblivious of the local condition. Diphtheria is a toxemia, but a practitioner who neglected the local treatment would surely not be doing his duty.

So in pneumonia elimination of the toxin and the raising of its effects does not comprise the whole treatment. The medical man who ever keeps the disease in all its aspects before him is the man who will treat his cases rationally. One is apt to treat disease too much by rule and rote.

It is true that no interference whatever could possibly check or shorten the course of a pneumonia still much may be done to relieve a patient. To allow nature to do its work unmolested, however rational it may seem to some is to my mind most irrational.

To take one symptom, dyspnea for instance are there not occasions when a medical man ought to step in and render aid? Has not a timely bleeding performed wonders in reducing the dyspnoeal movements and their consequent sense of distress? Surely this treatment is based upon the facts of pathological anatomy and the physical signs.

Major McI Smith would have us believe that the exudate is of no interest to us and not the cause of any of the symptoms, I should have thought that the dyspnea was not only toxic but that it also depended to some extent on the loss of respiratory surface caused by the pneumonic process and its collateral congestion. So too the administration of oxygen is based upon the consideration of the pathological condition. An ice bag over the affected area during the stage of engorgement may or may not reduce the activity of the hyperemia, but it certainly often reduces pain and renders the patient more comfortable. During grey hepatization warm applications to the chest may or may not promote the emigration of leucocytes into the alveoli of the affected area and thus help resolution, but they are certainly soothing and seem rational.

I am one of those who look upon the exudate as more than a non essential feature of the disease designed by a beneficent providence to enable me to diagnose the disease.

Acute pneumonia it is true may run its course favourably without any expectoration whatever. Yet I fancy that, although the exudate is removed chiefly by absorption still a small part is expectorated. So to my mind the exhibition of expectorants after the crisis is both rational and scientific.

Yours etc,

I HAY BURGESS, M.B., F.R.C.S.,

CAPT, I M S

SECUNDERABAD

QUININE AND PREGNANCY

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR—Regarding Dr. Subia Row's opinion of using "quinine in pregnancy," I beg to state that in my experience "quinine" rarely does harm to a pregnant woman suffering from malarial fever. Recently I treated two cases of advanced pregnancy (one seven months' pregnancy and another nine months' pregnancy), suffering from malarial

fever (both with high fever, enlarged spleen and liver). I treated them with quinine ten grains daily for four days. In both cases it did not induce labour at all. I administered quinine in malarial fever in pregnant state in several cases but with no bad result. I tried to induce labour in three malarial cases with pregnancy with quinine, but it proved ineffective.

DIARMADA
(NADIA)
18th October 1908

N K CHATTERJI,
[Hospital Assistant]

QUININE IN UTERINE INERTIA (A CASE)

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—A Hindu female, age 16, perfectly healthy, 9 months' pregnancy and *primipara*. Labour pain set up in the evening and continued regularly till midnight when liquor amnii flowed out in profuse quantity. But after that there was no sign of any pain whatsoever till the next morning when the patient's friends grew anxious and I was called in. At 8 A.M. I examined the case and found her quite at rest, she felt no complaints whatsoever. The os was fully dilated—head was presented but it was high up in the pelvis and not fixed. During examining it (head) moved away from my fingers. I prescribed sulphate of quinine (gr. 5) in acid solution combined with tinct. Cardamom co., to be continued every two hours for 3 doses. Just after the 2nd dose was finished, pain began to set in and at about 1 P.M. a living child was born without any hitch. The child was very ill nourished and looked immature and died at the 3rd day after delivery. Mother's condition remains as good as ever.

A G

Service Notes.

COLONEL GEORGE J. KELLIE, I.M.S., F.M.O., has retired from the service. Colonel Kellie was born in March 1854, entered the service in March 1877, was promoted to be Colonel 10th October 1905, and so completed 3 years' service in that rank.

He is succeeded in the rank of Colonel by Colonel A. M. Crofts, C.I.E., till now acting I.G.C.H. of Central Provinces.

It is a proof of the slowness in promotion in the I.M.S. that Colonel Crofts, one of our ablest men, only gets *pucca* promotion after 31½ years' service, and actually succeeds a man in his own batch, 31st March 1877.

FURLOUGH AND LEAVE—With reference to paragraph 222, Army Regulations, India, Volume II, it is notified for the information and guidance of all concerned that a copy of the order of the Government of India or of His Excellency the Commander in Chief authorising the grant of combined leave extending beyond the limits prescribed in India Army Orders Nos. 125 and 323 of 1908 should in future be attached to the final last pay certificate. In the absence of such authority it will be assumed at the India Office that the last pay certificate is incorrect and the officer concerned will be required to return to duty within the regulation period, or in the case of an officer who proceeded on leave before the commencement of the combined leave season, his leave will not be recognised as combined leave.

PENSIONS—It is notified for information that the Government of India have decided that the power of accepting medical certificates of incapacity for further service given by a single Commissioned Medical Officer or Medical Officer in charge of a civil station which has been heretofore vested in local Governments under Article 442 (d), Civil Service Regulations, may be delegated to the officers who have been authorised to sanction pensions of non-gazetted officers under the orders notified in India Army Order No. 459 of 1908.

PASSAGE MONEY INSURANCE CERTIFICATE INDIAN MILITARY SERVICE FAMILY PENSIONS—The Government of India have decided to issue, to officers who elect to provide passage money for their families under the provisions of Army Regulations, India, Volume I, paragraphs 817-820, a formal acknowledgment of the insurance in the form of a certificate, published as an annexure to this order. The certificate has been issued to each subscriber under Army Regulations, India, Volume I, paragraph 817, by the Examiner of Military Accounts, Eastern Circle.

FURLOUGH AND LEAVE—ESTABLISHMENTS—The Government of India have been pleased to sanction, in supersession of the ruling in (late) Military Department No. 991 O,

dated the 6th June 1895, the provisions of the note to Article 332, Civil Service Regulations, regarding the leave and allowances of Government servants segregated on account of infectious or contagious diseases, being extended to all establishments of the Army, Military as well as Civil, who do not at present come within the scope of the Civil Service Regulations, provided no extra expenditure is incurred by the replacement of the absentees.

THE Government of India having approved of the institution of a compulsory colloquial examination in the Punjabi language for medical officers posted to the Punjab for civil employ as Civil Surgeons, His Honour the Lieutenant Governor is pleased to prescribe the following rules for the examination—

RULES

Preliminary—These rules do not apply to officers already serving in the Punjab as Civil Surgeons, nor are they applicable to officers of the sanitary or jail departments or officers specially deputed on plague duty.

1 All commissioned medical officers posted for employment as Civil Surgeons in the Punjab and such Military Assistant Surgeons as are hereafter appointed Civil Surgeons are required to pass a colloquial examination in the Punjabi language within two years of their appointment to the Province in the case of commissioned medical officers and within two years of their appointment to the medical charge of a district in the case of Military Assistant Surgeons. An extension of this period will, if necessary, be allowed to officers who are posted to the districts in the Delhi division and have no opportunity of acquiring a colloquial knowledge of Punjabi.

2 An officer who has passed the Military Higher Standard Examination in Punjabi will not be required to present himself for examination under these rules.

3 Any officer of the Indian Medical Service who fails to pass the examination within the period prescribed in rule 1 will not be confirmed in civil employ until he does pass, and in the meantime he will be liable to be superseded by others below him who pass the examination. Any Military Assistant Surgeon who fails to pass will not be allowed to draw any further increments to his pay till he does pass.

4 The textbook prescribed for the examination is "Æsop's Fables in Punjabi" transliterated into the Roman character by F. A. Francis.

The following Grammars are also recommended—

For Eastern Punjabi—Newton's Punjabi Grammar, Edition of 1899.

For Western Punjabi—O'Brien's Multani Glossary and Wilson's Grammar of Western Punjab.

NOTE—All these books can be obtained from Rat Sahib Munshi Gulab Singh and Sons, Multani Press, Lahore.

5 The following are the subjects of the examination and the marks allotted to each—

	Marks
(a) Reading and construing portions of the text books	50
(b) Conversation in Punjabi with a native of the Punjab	100
Total	150

6 No candidate will be held to have passed who does not obtain at least half marks in each of the two groups. A candidate who obtains three fourths in each group will be passed with credit.

7 An examination will be held at Lahore half yearly at the time of the Departmental Examination of Assistant Commissioners, &c. Candidates wishing to appear should forward their applications through the Inspector General of Civil Hospitals, Punjab, in time to reach the officer conducting the examination at least a fortnight before the date of the examination.

PENDING the appointment of a successor to Colonel A. V. Crofts, I.M.S., in the Central Provinces, Lieutenant Colonel Roe, I.M.S., the Civil Surgeon, Nagpur, held charge of the current duties of the office of the Inspector General, Civil Hospitals.

CAPTAIN G. P. T. GROUBE, I.M.S. Assistant Plague Medical Officer, Perozepore, obtained privilege leave of absence for 35 days, under article 260 of the Civil Service Regulations with effect from the 22nd May 1908.

THE privilege leave of absence granted to Lieutenant Colonel A. Coleman, I.M.S., Civil Surgeon, Multan, in notification No. 697 dated the 27th of August 1908, was extended by a period of ten days.

TEMPORARY Assistant Surgeon P. S. Ram has been selected for admission to the permanent service of Government, and is appointed an Assistant Surgeon of the 3rd grade in the Punjab, with effect from the forenoon of the 26th May 1908.

THE furlough on medical certificate granted to Lieutenant Colonel S. Little, I.M.S., Civil Surgeon in Punjab Government Notification No. 359, dated 16th of April 1907, has been commuted by His Majesty's Secretary of State for India into ordinary furlough and extended to the 24th of April 1909.

THIRD Class Military Assistant Surgeon M. C. Pinto is appointed to the Civil Medical charge of the Chin Hills Palam, during the absence on leave of Honorary Lieutenant T. W. Minty or till further orders.

THE following officers are appointed as Civil Surgeons of the first class, with effect from the 26th April 1908—

(1) Lieutenant Colonel R. E. S. Davis	(3) Lieutenant Colonel R. H. Caster
(2) Lieutenant Colonel A. O. Evans	(4) Lieutenant Colonel F. J. Dewes

MISS ELAINE SHAW, M.B., C.M. (Mad.), who was appointed to be a Lady Doctor in Burma, on probation, in this Department Notification No. 449 dated the 19th December 1907, is confirmed in that appointment, with effect from the 18th January 1908.

WE regret to have to record the death at Mooltan from cholera on September 4th, 1908, of Lieutenant H. A. Knight, M.D. (Ed.), F.R.C.S. (Ed.), son of Dr. C. F. Knight of Portobello.

ON 29th September 1908 the small batch whose first commissions date from 29th September 1888 became Lieutenant Colonels, I.M.S. They are Lieutenant Colonel H. E. Drake Brockman, F.R.C.S. (Ed.), the Sanitary Commissioner, Mysore, Lieutenant Colonel W. B. Laue, I.M.S., I.G. of Prisons, C. P. Lieutenant Colonel P. J. Lumsden, I.M.S., Civil Surgeon, Ajmere, and Lieutenant Colonel S. E. Prall, I.M.S., Civil Surgeon of Aden.

MAJOR P. P. KILKELLY, M.B., I.M.S., has been granted privilege leave of absence for one month from the 1st October 1908.

HIS Excellency the Governor of Bombay in Council is pleased to appoint Major Ashton Street, M.B., F.R.C.S., I.M.S., to act as Ophthalmic Surgeon, Jamshedji Jijibhai Hospital, in addition to his own duties during the absence of Major P. P. Kilkelly, M.B., I.M.S., or pending further orders.

HIS Excellency the Governor in Council is pleased to appoint Captain J. Cunningham, M.B., I.M.S., to act as Assistant to the Director, Bombay Bacteriological Laboratory, vice Captain F. P. Mackie, M.B., F.R.C.S., I.M.S.

CAPTAIN F. P. MACKIE, I.M.S., has joined the Sleeping Sickness Inquiry under Sir David Bruce, F.R.S., R.A.M.C., in Uganda.

CAPTAIN H. A. DOUGAN, I.M.S., took charge of the Civil Medical duties of Kohat from Captain C. H. Reinhold, I.M.S., on 14th September.

CAPTAIN J. W. LITTLE, I.M.S., made over the Civil Medical duties of Dera Ismail Khan to Lieutenant W. D. H. Stevenson, I.M.S., on 30th August.

MAJOR CHAYTOR WHITE, I.M.S., is confirmed in the appointment of Sanitary Commissioner, U.P.

MILITARY Assistant Surgeon J. N. Turner is posted as Civil Surgeon at Gangtok from 21st August.

LIEUTENANT H. O. BUCKLEY, M.B., is promoted Captain, I.M.S., from 1st February 1908.

CAPTAIN DONALD STEEL, I.M.S. has been transferred to the permanent half pay list with effect from 1st November 1908. He was in the Bombay Bacteriological Laboratory and went on leave for 1 year and 56 days from 6th September 1907.

THE following retirements have received the approval of the King—

Colonel Thomas James Hackitt Wilkins. Dated 30th June 1908.

Lieutenant Colonel Robert Pemberton Dated 1st July 1908
 Lieutenant Colonel George Henry Bull Dated 1st July 1908
 Lieutenant Colonel Henry Armstrong Dated 30th June 1908
 Lieutenant Colonel Frederick Fitzgerald MacCurtie, C.I.L. Dated 30th June 1908
 Lieutenant Colonel John William Unthank Macnamara Dated 12th July 1908

INDIAN SUBORDINATE MEDICAL DEPARTMENT

Senior Assistant Surgeon and Honorary Captain Isaac Newton Dated 23rd July 1908

THE services of Lieutenant P. Heffernan, M.B., I.M.S., are placed temporarily at the disposal of the Government of Madras

THE services of Lieutenant C. R. O'Brien, M.B., I.M.S., are placed temporarily at the disposal of the Government of Eastern Bengal and Assam

CAPTAIN J. M. WOOLEY, I.M.S., Officiating Senior Medical Officer, Port Blair is appointed to be an Assistant Superintendent in the Settlement, with effect from the 3rd October 1908 and so long as he holds his present office, or until further orders

THE services of Captain R. F. Steel, M.B., I.M.S., are replaced at the disposal of His Excellency the Commander in Chief

CAPTAIN A. M. FIFLING, I.M.S., Civil Surgeon, C.P., has been granted, by His Majesty's Secretary of State for India, leave on private affairs for two months, in extension of the combined leave granted him by Order No. 2567, dated the 3rd December 1907

MAJOR E. JENNINGS, I.M.S., Superintendent, Central Prison, on return from leave, to Bareilly

MAJOR C. B. PRALL, I.M.S., Superintendent, Central Prison, on return from leave, to Lucknow

CAPTAIN G. HUTCHESON, I.M.S., Civil Surgeon, on return from leave, to Bijnor

CAPTAIN J. N. WALKER, I.M.S., Civil Surgeon, on return from leave, to Azamgarh

LIEUTENANT COLONEL G. H. BAKER, I.M.S., Civil Surgeon, on return from leave, to Fyzabad

LIEUTENANT COLONEL L. G. FISCHER, I.M.S., Civil Surgeon, on return from leave, to Mainpuri

CAPTAIN T. HUNTER, I.M.S., Civil Surgeon, on return from leave, to Rae Bareilly

CAPTAIN W. S. WILMORE, I.M.S., Civil Surgeon, on return from leave, to Farrukhabad

MAJOR J. C. ROBERTSON, I.M.S., Deputy Sanitary Commissioner, on return from leave, is placed on special duty to enquire into the prevalence of malaria fever in the United Provinces

CAPTAIN J. H. HORTON, I.M.S., attached to the 14th Murray's Jat Lancers, to hold civil medical charge of the Bareilly district in addition to his military duties, vice Lieutenant Colonel J. Sykes, I.M.S., granted leave

LIEUTENANT COLONEL A. W. DAWSON, I.M.S., to hold civil medical charge of Roorkie in addition to his military duties, vice Major E. M. Morphey, R.A.M.C.

CAPTAIN L. REYNOLDS, I.M.S., Officiating Superintendent, Central Prison, on being relieved, from Lucknow to Agra

CAPTAIN W. M. PFARSON, I.M.S., Officiating Civil Surgeon, from Bijnor to Banda

CAPTAIN W. LAPSLEY, I.M.S., Officiating Civil Surgeon, from Azamgarh to Jaunpur

THE services of Captain J. S. O'Neill, I.M.S., Officiating Superintendent, Central Prison, Bareilly are, on being relieved, hereby replaced at the disposal of the Government of India, Home Department

CAPTAIN V. H. ROBERTS, I.M.S., District Plague Medical Officer, Gujarat, has been granted nine months' study leave, under paragraph G of Military Supply Department notification No. 16, dated the 15th of March 1907, and nine months' general leave out of India, under the leave rules of 1886 for the Indian Army, with effect from the date on which he may avail himself of the leave. His tenth year of pension service commenced on the 28th January 1908

LALA KIDAR NATH, BHANDARI, made over charge of the duties of Superintendent of the Jullundur district jail to Major H. Smith, I.M.S., on the afternoon of the 22nd September 1908

ON return from the privilege leave of absence granted to him in Notification No. 298, dated the 25th of August 1908, Captain W. T. Finlayson, I.M.S., Superintendent of the Lahore District and Komalo Jails resumed charge of his duties on the forenoon of the 10th September 1908, relieving Major C. H. Bensley of the additional charge

LIEUTENANT F. S. SMITH, I.M.S., to hold charge of the Civil Medical duties of Buva Duai in addition to his military duties

CAPTAIN N. M. WILSON, I.M.S., handed over charge of the plague duties of Hoshurpur to Rai Thakur Das Bahadur, on 19th August 1908

CAPTAIN M. S. IRANI, I.M.S., on return from leave, is posted to Lyallpur as asst. plague medical officer

CAPTAIN G. I. DAVIS, I.M.S., obtained fifty days leave of absence from 26th August 1908

COLONEL T. GRAINGER, I.M.S., recently officiating P. M. O., on the Frontier, takes 6 months' leave on the return of Colonel Bortson, C.B., I.M.S.

ON return from leave, Captain G. Hynes, I.S.M.D., is posted to Patohpur, U.P.

HIS Excellency the Governor of Bombay in Council is pleased to appoint Mr. Fiamioze Navroji Kapadia, L.M. & S., to be Honorary Assistant Physician, Jamsiedji Jijibhai Hospital, for a term of one year, vice Mr. Dhanjibhai Pestonji Sethna, L.M. & S.

MAJOR S. E. PRALL, M.B., B.S., I.M.S., has been granted, from the date of relief, such privilege leave of absence as was due to him on that date in combination with furlough on medical certificate for such period as may bring the combined period of absence up to six months

WITH reference to Government Notification No. 5333, dated the 28th August 1908, His Excellency the Governor of Bombay in Council is pleased to make the following appointments—

Captain C. H. S. Lincoln, M.R.C.S., L.R.C.P., I.M.S., on reversion to be Civil Surgeon, Dhulia
 Assistant Surgeon J. E. Bocatto, L.M. & S., on relief, to act as Civil Surgeon, Broach, vice Assistant Surgeon Sorabji Fardunji Gandhi, L.M. & S., pending further orders

MISS A. M. BENSON, M.D., first Physician, Pestonji Hormas Kama Hospital for Women and Children, Bombay, is granted privilege leave of absence for one month and fourteen days, with effect from the date of relief

LIEUTENANT COLONEL H. P. DIMMOCK, M.R.C.S., L.R.C.P., M.D. (Dur.), I.M.S., has been allowed by His Majesty's Secretary of State for India to return to duty within the period of his leave

PRIVILEGE leave for one month, under Article 260 of the Civil Service Regulations, is granted to Captain D. N. Anderson, I.M.S., Officiating Civil Surgeon, Chandni, with effect from the 4th October 1908, on the subsequent date on which he may avail himself of it

THIRD Grade Civil Assistant Surgeon Stephen Ramchandra Rao attached to the Main Dispensary, Chanda, is appointed to officiate as Civil Surgeon, Chanda, during the absence on leave of Captain D. N. Anderson, I.M.S., or until further orders

MAJOR HERBERT ST. JOHN FRASER, I.M.S., Madras, has been transferred by the Secretary of State for India to the temporary Half Pay List, subject to His Majesty's approval, with effect from the 9th October 1908.

THE services of Captain J. Cunningham, M.B., I.M.S., are placed at the disposal of the Government of Bombay.

THE services of 3rd Class Assistant Surgeon D. E. Barrett, Indian Subordinate Medical Department, are placed at the disposal of the Government of Bombay for temporary employment on the staff of the Port Health Officer, Bombay, with effect from the 31st August 1908.

SECOND Class Assistant Surgeon P. B. Mills, Indian Subordinate Medical Department, in medical charge of the Agricultural Research Institute, Pusa, is granted one month's privilege leave with effect from the 1st September 1908.

THE services of 1st Class Assistant Surgeon W. J. Corridon, Indian Subordinate Medical Department, are placed at the disposal of the Government of the United Provinces of Agra and Oudh, for civil employment in that Province, with effect from the 23rd August 1908.

THE services of No. 1080, 2nd Class Hospital Assistant Barkatullah, Indian Subordinate Medical Department, are placed at the disposal of the Foreign Department for employment at Kashgar, with effect from the 1st July 1908.

LIEUTENANT COLONEL R. E. S. DAVIS, I.M.S., has been granted by His Majesty's Secretary of State for India an extraordinary leave without pay from the 23rd November to the 2nd December 1908.

MAJOR C. M. MATHEW, I.M.S., is appointed to hold temporary charge of the Civil Surgeoncy at Bhamo, in place of Captain J. M. Holmes, M.B., I.M.S.

CAPTAIN H. E. SMITH, M.B., I.M.S., is appointed to officiate as Chemical Examiner and Bacteriologist Burma, in place of Captain R. D. Sangol, M.B., I.M.S., transferred.

LIEUTENANT COLONEL T. W. STEWART, I.M.S., is appointed as Civil Surgeon of the first class, with effect from the 26th April 1908.

HONORARY CAPTAIN F. J. DALEY, I.S.M.D., Assistant to the Civil Surgeon of the 24 Parganas, is appointed to be Medical Officer, Eastern Bengal State Railway, Sealdah, vice First Class Military Assistant Surgeon M. Galvin, transferred.

FIRST Class Military Assistant Surgeon M. Galvin, Medical Officer, Eastern Bengal State Railway, Sealdah, is appointed to be Assistant to the Civil Surgeon of the 24 Parganas, vice Captain F. J. Daley, I.S.M.D., transferred, and since then has been appointed Superintendent of the new Juvonic Jail at Alipore, Calcutta.

ON the return of Lieutenant Colonel E. Harold Browne, I.M.S. to Alipore, Major D. Chatterton, M.C.H. (Dnb.), was transferred to Muzaffarpore as Civil Surgeon, and Captain J. W. Rait, I.M.S., went back to Pune.

WHILE on leave Major F. N. Windsor, I.M.S., Chemical Examiner and Bacteriologist, Burma, was on study leave from 8th April till 10th August 1908.

SECOND Class Military Assistant Surgeon F. H. O'Leary is appointed to the civil medical charge of the Hantlawaddy District in place of Honorary Lieutenant J. Fraser, Senior Military Assistant Surgeon, transferred.

THE service of 2nd Class Assistant Surgeon E. A. Pirchey, Indian Subordinate Medical Department, are placed at the disposal of the Government of the Punjab, for temporary civil employment in that Province, with effect from the 28th September 1908.

THERAPEUTIC NOTES

IMPORTANT ARYLARSONATES

STRIKING clinical results have been obtained with the new arylarsonates introduced by Burroughs, Wellcome & Co., under the trade mark names of 'Soamin,' 'Kharsin' and 'Oisudan.'

In the treatment of syphilis, sleeping sickness, malaria and other protozoal diseases the low toxicity of these salts enables physicians to administer comparatively large quantities of arsenic without any toxic effects.

SOAMIN (*Sodium Para aminophenylarsonate*) is stable, uniform in action, is soluble in about five parts of water, and gives a neutral solution which can be sterilised. It contains 22.8 per cent of arsenium in organic combination, and has less than 1/40 the toxicity of arsenious acid.

Results of the administration of 'Soamin' in cases of syphilis demonstrate the great therapeutic value of this agent (See accompanying reprint from the *British Medical Journal*, 15th August 1908).

'Soamin' (Powder) is issued in bottles of 5 gm. and 30 gm.

'Tabloid' 'Soamin' is issued—

gr. 1 in bottles of 100

gr. 5 and 0.3 gm. in bottles of 25

'**KHARSIN**' (*Sodium 3 methyl 4 aminophenylarsonate*) is soluble in two and a half times its weight of water, and gives a neutral solution. It contains 23.7 per cent of arsenium and is about equal in toxicity to 'Soamin.'

'Kharsin' (Powder) is issued in bottles of 5 gm. and 30 gm.

'Tabloid' 'Kharsin' gr. 1 is issued in bottles of 100

'**ORSUDAN**' (*Sodium 3 methyl 4 acetylaminophenylarsonate*) is anhydrous. It is soluble in three times its weight of water and gives a neutral solution. It contains 25.4 per cent of arsenium and is the least toxic of the three salts, being 1.5 or 1.6 less toxic than 'Soamin.'

'Oisudan' has proved by recent clinical trials to be of marked value in malaria.

'Oisudan' (Powder) is issued in bottles of 5 gm. and 30 gm.

'Tabloid' 'Oisudan' gr. 1 is issued in bottles of 100

CAUTION

The arylarsonate salts should not be given by the mouth, as they are broken up by the acid contents of the stomach and the effects of over-treatment by arsenic are thus more easily produced. Freshly prepared solutions should be administered by subcutaneous or intramuscular injection, preferably the latter.

'Soamin' should not be used simultaneously with mercury, nor administered until fifteen days after mercurial treatment has ceased.

Zimmer & Co. ask us to publish the following note to which we direct the attention of our readers—

"We take this opportunity of calling your attention to inferior imitations of Enquimine, sometimes offered for sale. We had an opportunity of examining a preparation styled Chinin ethyleaibonem (Quinine Ethyleaibonate), it was bad in color, bitter tasting and impure, containing amongst other ingredients, magnesia. We must most emphatically warn you against such spurious imitations. Apart from the fact that we should fully defend our patent and trade mark rights, the selling of such worthless products is injuring the patient and may also unpleasantly affect the reputation of the doctor who has prescribed the medicament."

Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscriptions to "*The Indian Medical Gazette*," Rs. 12 including postage, in India. Rs. 14, including postage, abroad.

BOOKS, REPORTS, &c., RECEIVED —

Bombay Hospitals Reports
Fifth Military Hygiene (Churchill)
Osiers An Alabama Student (Holder & Stroughton)
Simpson's Tropical Hygiene (Bole Sons & Daulele)
Mental Deficiency (Baillière, Tindall & Cox)
Allbutt's System Vol. IV, Pt. 1 (Macmillan & Co.)
Allen's Vaccino Therapy (H. H. Lewis)
The Bacteriology of the Eye
Rose and Careless, Surgery New Edition
Goodall's Infectious Diseases New Edition (H. H. Lewis)

LETTERS, COMMUNICATIONS, &c., RECEIVED FROM —

Major Henry Smith, I.M.S., Jullundur. Capt. McCarrison, I.M.S., London. Capt. Megaw, I.M.S., London. Lt. Col. Jennings, I.M.S., Bombay. Capt. Hay Burgess, I.M.S., Dr. Lloyd Patterson, Borjull, The Hon. Col. R. D. Murray, I.M.S., Lucknow. Major J. T. Culvert, I.M.S., Durgellah. Capt. Connor, I.M.S., Madras. Lt. Mackworth, I.M.S., Dr. Nerb, Srinagar. Dr. Owen Lahore.

FEDERATED MALAY STATES.

Colonial Medical Reports.—No. 1.—Perak.

MEDICAL REPORT FOR THE YEAR 1906

By S C G FOX.

Acting State Surgeon

VITAL STATISTICS

THE system in vogue in Perak for the registration of births and deaths is satisfactory as a mere record of these events, but as to giving the true cause of the deaths it is, of course, fallacious. It is difficult to see how in the present undeveloped condition of the State it could be otherwise. The accurate certifying of deaths would involve a great increase of the medical staff and expenditure. Except for the occasional detection of crime it would at present serve no real purpose.

The estimated population for the year 1906 is 399,393, an increase of 6,984 for the year under review. There were 7,675 births, which, with a population of 399,393, gives a birth-rate per thousand of 19.21, a decline of 1.66 when compared with the previous year's figures.

The deaths amounted to 12,952, calculating this with the estimated population of 399,393, the death-rate works out to 32.42 per mille, last year the mortality was 31.85 per mille. The mortality among Chinamen in the State of Perak is 37.07 per thousand, this is a very abnormal rate, especially when we know that we are dealing with comparatively a picked lot of men belonging to a nation whose physique and vitality are notorious.

The death rate of the Chinese practically represents the mortality among tin miners, it tells that the mining industry under the most favourable conditions cannot be considered a healthy occupation. Underground mining is becoming general in Perak, and there are no figures or other indications to suggest that this form of work is more unhealthy or otherwise than occupations on the surface. There has not been much change in the death-rates of our various hospitals during the last fifteen years, the mortality in mining districts has varied from 10 to 20 per cent, and the reason for this is, in my opinion, due to the insanitary condition the coolies are allowed to live in. A Chinese miner is permitted to treat his coolies just as he likes, he puts them into a kongsi built on the edge of a swamp, with no provision for water, the jungle growing almost up to the hut, the kongsi is usually overcrowded, and any quality of rice and salt fish is supplied, small wonder it is that the Chinese death rate is 37.07 per mille, while his brother in South Africa, who is under medical supervision, and about whose hardships we have heard so much, succumbed only at the rate of 18.4 per thousand. It is obvious, therefore, that something should be done to reduce the high death rate among the Chinese miners here. An employer of mining labour should be enforced to recognise his obligations, there are many ways in

which this could be done. Suggestions with the view to antagonise the disastrous results of unhygienic surroundings will be submitted to Government at an early date.

Turning now to the mortality among the Tamils, which is 57.36 per mille, we are brought into contact with another principal industry of this State—viz, planting—as most of the labour employed on the estates is Tamil.

The Krian district may be considered at present to be the most important planting area in Perak, and from the hospital returns of some of the bigger estates in it we find that Klompang estate, with a labour force of 700, has a death-rate of 94.2 per thousand, Gedong, with a labour force of 1,204, has a death-rate of 55.6 per thousand, and Gula, whose labour force is 1,950, has a death rate of 32.8 per thousand. The fatality on these estates is high, but I venture to remark that they are not so bad as some of the younger estates in other parts of Perak from which no records or returns are obtainable.

During the past year new estates and fresh clearings, probably fifty, have been opened, and I regret to state that in many instances the primitive points of hygiene have not been observed. It has been observed that "the days of tapping and enormous profits are at hand", it is hoped that some of the dividends may be spent on behalf of coolies. Money so spent will prove a good investment in the long run.

The prevailing diseases among the Tamil coolies are malaria, dysentery, and alcoholism. I have elsewhere referred to the hard drinking among estate coolies. A constitution weakened by alcohol soon falls a victim to malaria or dysentery.

In analysing the causes of death in the different districts one is struck by the large number of deaths from "fever." Of 12,952 deaths in the whole State of Perak from all diseases, 5,669, almost half of the total number and 1,377 of them being in women, are from fever. These figures would make out Perak to be a fever infected place, which we know not to be the case. It illustrates the inaccuracies I have already referred to as to the registration of the cause of death. In this instance fever covers a multitude of diseases, not the least important of these being puerperal fever.

THE DISTRICT HOSPITALS

Distributed among the fourteen hospitals in Perak at the end of 1906 were 1,242 patients. The number admitted during 1906, including those remaining from 1905, was 25,455, for the previous year 27,212 were treated as in-door patients, a falling off of 1,757.

The percentage of deaths for all cases treated in the State hospitals during the year was Taiping, 18.08, Kuala Kangsar, 12.79, Batu Gajah, 16.24, Gopeng, 17.59, Ipoh, 18.43, Kampar, 16.13, Telok Anson, 7.81, Tapah, 11.79, Parit Buntar, 8.12, Bagan Serai, 8.36, Selama, 4.31, Lenggong, 7.46, Tanjong Mahm, 5.51, Grit, 8.93.

There has been an increase in the death-rate at most of the important hospitals, and this fact has been brought about by the fatal form of beriberi prevailing during the year.

The death-rate for 1906 of 31.81 per cent is the highest for many years, in fact, it has only once been exceeded, and that was in 1881, when the mortality reached 40.75 per cent.

Malarial Fever—The direct contribution of malaria to the mortality is small, but its indirect effect in predisposing to other acute diseases, especially to bowel complaints, is very considerable. The prophylactic measures taken against this disease during the year under review have not been of an extensive nature. In some of the bigger towns, such as Taiping and Ipoh, some ponds have been filled in and swamps drained. With our heavy rainfall the banishment of puddles and other suitable places for the breeding of mosquitoes is practically impossible, the only way of keeping malarial fever in check is with quinine, mosquito nets, and wire gauze. In districts like Krian and Matang, at certain times of the year, life is almost unbearable after sunset from these pests, and at these places there should be at least one mosquito proof room in each quarter. This has partly been done in Parit Buntar, and the inhabitants are truly grateful for this attention.

Dr. Geriand, in his annual report, refers to the decline of malarial fever in Krian by some 7,179 cases when compared with the year before. He attributes this to the further extension of the travelling dispensary. It is quite evident from experience gained that the further distribution of quinine and other simple drugs to the poor in the out districts must be done by extending the travelling dispensary to outlying villages off the beaten track.

Diarrhoea and Dysentery—For the year under review 3,807 cases were treated for both these diseases, with 1,106 deaths. Most of the fatalities were from relapses, while the others must be regarded as the fatal terminations of other diseases.

Pulmonary Diseases—The number of phthisis cases treated for the year was 894, with 444 deaths. At some of the hospitals where space was available a ward was set aside for phthisical patients, a liberal diet was given, and every endeavour made to keep the ward as "open air" as possible.

Pneumonia of a particularly virulent type comes for treatment. The figures for the year were: Cases treated, 225, deaths, 109, percentage, 48.44.

Cholera broke out in the Krian district in May, there were 66 cases, with 32 deaths. The epidemic was stamped out in fourteen days.

Anæmia—In 1905, 682 cases of anæmia were treated, with 90 deaths, and last year 539, with 73 deaths. *Debility* shows that there were 593 treated with 64 deaths in 1905, against 458 cases and 68 deaths in 1906.

Small-pox—There were 26 cases of small pox during the year, with 11 deaths.

Venereal Diseases—Notwithstanding the increase in the population, the admissions into the State hospitals for venereal diseases show a diminution. It cannot be denied that, in spite of the considerable differences of opinion, the preventive measures carried out by the surgeons have been attended with good results.

GAOL HOSPITALS

There have been many changes at the Central Prison, Taiping, during the year. The completion and occupation of a new hospital, the construction of new blocks of stone breaking cells, special regard being paid to the ventilation, the conversion of the prison for long sentence prisoners only. The daily average of prisoners was 649.69, for the previous year it was 618.99. The percentage of deaths to total treated was 3.20.

The health of this gaol may be considered to have been good, in view of the fact that during the greater part of the year the institution was overcrowded. Cases of diarrhoea and dysentery were somewhat prevalent, there being some 170 cases during the twelve months under review.

Malarial fever was particularly rife among the European warders and their families, the native warders also suffered. A quinine parade was instituted for these men, and was attended with good results.

The Batu Gajah gaol had a daily strength of 244.72 compared with the previous year, when it was 292.15. The death rate for the hospital was 4.12 per cent.

LUNATIC ASYLUM

The past year has been a bad one for the lunatic asylum. Dysentery of a bad type has prevailed for the greater part of the year, there being 320 cases treated, showing a daily average of 132.10, with the percentage of deaths 26.56.

The present building is quite unsuited for the treatment of a large number of lunatics, it was never intended for such a purpose. Overcrowding in close proximity to latrines has proved destructive to health, and the only remedy I can suggest is the construction of the new lunatic asylum as soon as possible. Out of a total of 85 deaths, 60 were caused by dysentery and diarrhoea. The recovery rate of the lunatics is calculated at 46 per cent, which, compared with asylums in England, is considered satisfactory.

LEPER ASYLUMS

Pangkor Laut is for Malays only, and during the year 46 were treated, with 10 deaths. Although everything possible is provided to make these unfortunates happy and comfortable, it cannot be said that the asylum is a popular institution. Directly a Malay leper thinks he is wanted for Pangkor Laut he generally disappears, usually to Kedah.

The District Surgeon, Lower Perak, reports that the inmates of this asylum were engaged in the planting of vegetables and the rearing of poultry. The water supply has been ample during the year, as the new reservoir has been completed.

At the three Perak wards attached to the Colonial Asylum, 126 were treated, with 30 deaths. Another

RETURN OF DISEASES AND DEATHS IN 1906 AT THE FOLLOWING INSTITUTIONS —

Fourteen District Hospitals, at Taiping, Kuala Kangsar, Batu Gajah, Gopeng, Ipoh, Kampar, Telok Anson, Tapah, Parit Buntar, Bagan Serai, Selama, Lenggong, Tanjong Malim and Grit; two Gaol Hospitals, at Taiping and Batu Gajah, one Lunatic Asylum, at Taiping, two Leper Asylums, at Pulau Jerejak and Pulau Pangkor Laut

GENERAL DISEASES				GENERAL DISEASES—continued			
	Admissions	Deaths	Total Cases Treated		Admissions	Deaths	Total Cases Treated
Alcoholism	13	—	13	(d) Tabes Mesenterica	—	—	—
Anæmia	509	73	539	(e) Tuberculous Disease of Bones	—	—	—
Anthrax	—	—	—	Other Tubercular Diseases	—	—	—
Beri beri	2,425	886	2,785	Varicella	—	—	—
Bilharziosis	—	—	—	Whooping Cough	—	—	—
Blackwater Fever	—	—	—	Yaws	6	1	8
Chicken pox	8	—	10	Yellow Fever	—	—	—
Cholera	—	—	—				
Cholera Diarrhoea	—	—	—	LOCAL DISEASES			
Congenital Malformation	—	—	—	Diseases of the—			
Debility	422	68	458	Cellular Tissue	611	24	639
Delirium Tremens	1	—	1	Circulatory System—	—	—	—
Dengue	—	—	—	(a) Valvular Disease of Heart	69	26	70
Diabetes Mellitus	4	3	1	(b) Other Diseases	32	9	36
Diabetes Insipidus	—	—	—	Digestive System—	—	—	—
Diphtheria	—	—	—	(a) Diarrhoea	1,149	331	1,208
Dysentery	2,462	775	2,599	(b) Hæmorrhæa	—	—	—
Enteric Fever	25	16	25	(c) Hepatitis	3	—	3
Erysipelas	23	2	23	Congestion of Liver	—	—	—
Febricula	4	—	1	(d) Abscess of Liver	13	8	13
Filariasis	—	—	—	(e) Tropical Liver	—	—	—
Gonorrhoea	325	1	351	(f) Jaundice, Catarrhal	47	13	50
Gout	—	—	—	(g) Cirrhosis of Liver	39	31	41
Hydrophobia	—	—	—	(h) Acute Yellow Atrophy	—	—	—
Influenza	1	—	1	(i) Sprue	4	1	4
Kala Azar	—	—	—	(j) Other Diseases	578	76	597
Leprosy	231	85	114	Ear	20	—	21
(a) Nodular	—	—	—	Eye	271	11	300
(b) Anæsthetic	—	—	—	Generative System—	—	—	—
(c) Mixed	—	—	—	Male Organs	507	7	524
Malarial Fever—	—	—	—	Female Organs	75	3	81
(a) Intermittent—	—	—	—	Lymphatic System	373	10	388
Quotidian	1,956	65	2,002	Mental Diseases	175	84	318
Tertian	192	10	192	Nervous System	284	53	309
Quartan	18	1	18	Nose	3	1	4
Irregular	347	9	347	Organs of Locomotion	138	6	147
Type undiagnosed	2,126	58	2,212	Respiratory System	1,673	598	1,781
(b) Remittent	151	54	158	Skin—	—	—	—
(c) Pernicious	62	23	62	(a) Scabies	—	—	—
(d) Malarial Cachexia	—	—	—	(b) Ringworm	—	—	—
Malta Fever	—	—	—	(c) Tinea Imbricata	—	—	—
Measles	3	—	3	(d) Favus	—	—	—
Mumps	8	—	8	(e) Eczema	231	3	241
New Growths—	—	—	—	(f) Other Diseases	3,087	99	3,304
Non malignant	15	1	15	Urinary System	259	63	273
Malignant	33	17	37	Injuries, General, Local—	—	—	—
Old Age	—	—	—	(a) Striasis (Heatstroke)	—	—	—
Other Diseases	34	3	34	(b) Sunstroke (Heat Prostration)	1	—	1
Pellagra	—	—	—	(c) Other Injuries	1,490	40	1,546
Plague	—	—	—	Parasites—	194	1	187
Pyæmia	2	1	2	Asearis lumbricoides	101	—	104
Rachitis	3	—	3	Oxyuris vermicularis	—	—	—
Rheumatic Fever	2	—	2	Dochmius duodenalis, or Ankylos	—	—	—
Rheumatism	176	1	182	toma duodenale	106	21	113
Rheumatoid Arthritis	—	—	—	Dracunculus medinensis (Guinea	—	—	—
Scarlet Fever	—	—	—	worm)	—	—	—
Scurvy	—	—	—	Tape worm	—	—	—
Septicæmia	3	1	3	Poisons—	—	—	—
Sleeping Sickness	—	—	—	Snake bites	—	—	—
Sloughing Phagedæna	77	2	88	Corrosive Acids	—	—	—
Small pox	10	3	11	Metallic Poisons	4	1	4
Syphilis	—	—	—	Vegetable Alkaloids	18	2	18
(a) Primary	363	3	361	Nature Unknown	—	—	—
(b) Secondary	1,495	81	1,611	Other Poisons	47	3	49
(c) Tertiary	—	—	—	Surgical Operations—	—	—	—
(d) Congenital	3	—	3	Amputations, Major	3	—	4
Tetanus	6	4	6	Minor	2	2	2
Trypanosoma Fever	—	—	—	Other Operations	19	1	26
Tubercle—	36	8	37	Eye	—	—	—
(a) Phthisis Pulmonalis	—	—	—	(a) Cataract	15	—	16
(b) Tuberculosis of Glands	—	—	—	(b) Iridectomy	—	—	—
(c) Lupus	—	—	—	(c) Other Eye Operations	—	—	—

ward has been sanctioned and is about to be built, and when finished it will relieve the congestion in the receiving ward at Taiping, which has been overcrowded during the whole year

VACCINATION

The two Government vaccinators were fully employed during the year. A third one was appointed, and after working a few months he got into debt and absconded. His place has not yet been filled. Last year there were only 10.45 per cent of failures, as compared with 24.53 for the year before.

OUT-DOOR DEPARTMENT

The numbers of out door patients at the hospitals are not as high as in previous years. There has been a decrease in the repetitions, chiefly —

Year	New cases	Repetitions	Total visits
1904	34,060	18,731	52,791
1905	33,241	19,254	52,495
1906	33,107	17,238	50,345

From the above figures it would seem that the first visit to the out patient department resulted in cure or relief more frequently than in previous years.

TRAVELLING DISPENSARY

The travelling dispensary has been resumed in most of the districts. The shortness of the staff still renders it a matter of difficulty to carry on the work in Kinta as extensively as I could wish. In the Krian district the travelling dispensary was extended to exclude Kuala, Kuala, Jalan Bahru, Titi Seiong, Kampong Padre, Alor Pongsu, Telok Medan, Selinsing, Bria, and Tanjong Pindang, and takes in approximately 6,000 of the Krian inhabitants, chiefly Malays, who were not reached medically before.

VETERINARY DEPARTMENT

The report submitted by Mr. Short is an interesting one. He points out that surra gave very little trouble during the year.

Rinderpest — Only one outbreak occurred in Kota, on April 20. Twenty five animals contracted the disease, of which 12 died.

Swine Fever prevailed during the year, and so did foot-and mouth disease.

There were 327 prosecutions by the veterinary police during the year, with 308 convictions, and the fines amounted to \$4,597. The quarantine station for cattle at Port Weld is most unsatisfactory. Except during and after a long spell of dry weather the place is a veritable quagmire. A new quarantine station is urgently needed on higher ground.

METEOROLOGY

Taiping once more heads the list as having the largest rainfall, viz., 176.20 in. Selama is next, a long way behind, with a record of 145.05 in. Lenggong would seem to be our driest station, the rainfall there for the year being only 76.72 in. Ipoh comes next with 85.22 in. In Taiping there were one hundred and twenty-four days on which no rain fell, and at Ipoh one hundred and sixty-one.

GENERAL SANITARY CONDITION OF THE VARIOUS TOWNS

Much attention has been devoted to sanitation in Ipoh, the largest and the youngest town in Perak. The general conservancy arrangements, especially for the proper disposal of house refuse and street sweepings, were satisfactorily effected.

The general conservancy arrangements at Taiping have been satisfactory.

Most of the houses in the native portion of the town are covered with mould, and reek with dampness. The rays of the sun are not able to shine on the many buildings on account of the large trees which are allowed to surround the houses. I am distinctly opposed to shade trees being allowed to grow so close to dwelling-houses as to keep out the rays of the sun, the greatest purifying agency we have.

The sanitary state of Krian has, according to the District Surgeon, progressed markedly during 1906. Well-drained back lanes were put into Bagau Serai.

Mosquito rooms have been added to the official quarters at Parit Buntar, which are now described as being "luxurious in their freedom from nightly pests, and more any and comfortable than any bed-curtain."

The opening of the Government Dairy early in 1907 will, it is hoped, check the sale of watered milk.

An extension of the water from the irrigation canal to Kuala Kuala and other parts of the district, where cholera is frequently a visitor, should be a boon to the inhabitants, especially during the dry season.

At Kuala Kangsar the chief event of the year has been the completion of the water supply. Wholesome water is now brought to the town in pipes from a distance of 7 miles.

In Batang Padang the District Surgeon submits an interesting report of the sanitary measures adopted in the various townships in the district. The work of supplying the town with pipe water should be completed early in 1907. The work at the new hospital was proceeded with, and the District Surgeon contemplates that in February, 1907, the transfer to the new buildings will take place.

THE SOCIETY OF TROPICAL MEDICINE AND HYGIENE

A MEETING of the above Society was held at 20, Hanover Square, London, W., on Friday evening, December 20, 1907, Sir Patrick Manson, President, occupying the chair. The following paper was read:

EXPERIENCES OF ANKYLOSTOMIASIS IN AUSTRALIA

By Dr T. F. MACDONALD

MR. PRESIDENT AND GENTLEMEN,—When Professor Sandwith honoured me by suggesting that I should contribute a short paper to night on the subject of ankylostomiasis, I very readily embraced the opportunity of receiving your expert criticism upon some of the Australian manifestations of that disease.

By way of introduction, I may mention that tropical medicine, as far as Australia is concerned, has recently assumed an entirely new importance, owing to the advent of workers of the white race in tropical industries of North Queensland. There, within the last few years, South Sea Island and other coloured labour generally has been replaced by workers of our own people, in fulfilment of the national ideals of "White Australia," and for the first time in history the Caucasian skin has been presented with an opportunity of proving its power to survive under democratic conditions in tropical lands. Tilling and milling of sugar cane, previous to our Queensland experiments, have never been done by other than coloured races. The significance of this departure from ancient custom is obvious. With millions, instead of hundreds, of white people in the Tropics, we, who subserve the best interests of the people by striving to keep them in good health, may count upon a much-to-be desired increase of public support. Institutions for the study of tropical science, such as we only dream of now, will, I sincerely hope, multiply with truly tropical luxuriance. To some extent I am responsible for the later positive issue of the great controversy in Australia, as to whether white people could or could not do all necessary work in tropic culture, my reports and representations to the Federal Government being quite the first to contain a shade, at least, of scientific evidence in support of the affirmative propositions. The moral obligation and responsibility thus incurred lent particular interest to my efforts to cope with Australian tropical diseases, especially with that of ankylostomiasis. That insidious enemy of health I found deeply rooted and flourishing among the inhabitants of the Johnstone River district (which is situated between Townsville and Cairns, somewhere about the 14th S. line of latitude), when, in 1895, I commenced practice there, after visiting Egypt, China and Japan, and learning some of the main features of tropical work.

Planted in the heart of a jungle or scrub 60 miles square, with a rainfall of 200 in., frost unknown, here were ideal conditions for the incubation of parasites, and here *Ankylostomum duodenale* spread from family to family with almost incredible swiftness.

Having determined the parasite, secured from a patient who dwelt in a house wherein three deaths had taken place prior to my arrival, and which had been

reported as Bright's disease with dropsy, I took steps to have my diagnosis confirmed, sending specimens of the worms to Brisbane, Sydney and Melbourne, with the result of confirmation of my view as to their identity.

Link by link I picked up the chain of evidence of the serious nature of Australian infection by this disease. Reported from Cairns, Townsville, and Brisbane, the worm had been looked upon, more or less, as curiously rare.

After my first reports as to the magnitude of the infection in my own district, Dr T. L. Bancroft, of Brisbane, was good enough to keep me posted with all the latest papers on the subject, among others those of Dr Looss, of Egypt, after which the advice to "use earth closets and wear boots" became an aphorism.

More and more I became animated with the desire to stamp out the scourge, which I could see plainly was sucking the heart's blood of the whole community. In vain, however, I appealed to municipal authorities, and to the Queensland and Federal Governments for assistance. The Chief Medical Officer of Health in Queensland received contradictory reports from various local health officers, and, unfortunately, did not himself visit the affected areas, and so put my public statements on the matter down to gross exaggerations. As if it were possible to exaggerate the seriousness of conditions where a community of some 5,000 people in tropical environment is infected with ankylostomiasis, to the extent that cases were found in almost every square mile of the district, where the administration of thymol had to become almost routine treatment among plantation labour, and where every farm provided victims. Ninety per cent of the scholars in one school alone were found to be infected with ankylostomes, when in one day I subjected the whole school to treatment, and these were white children.

The happy thought struck me to enlist the sympathetic assistance of the Bishop of North Queensland, who, much to his credit, entered heart and soul into my proposition, that a School of Tropical Medicine and Research Institute should be established in Townsville, the capital of our Tropics. Quite recently the Federal Government has voted the necessary funds for that purpose, and I shall await with much interest the contradiction or confirmation of my statements concerning ankylostomiasis in Australia.

As to the disease itself. Among children the most pronounced symptom was the extraordinary appetite displayed for eating earth, not in a casual manner, but under the impulse of an irresistible craving. Babies would pick dirt from the seams on the floor, or from boots carelessly left uncleaned, older children frequently expressed a desire to suck stones, preferring such luxuries to sweets. Adults did not eat earth, but developed abnormal delights in pickles, curries, and alcohol.

Quite the most interesting feature of the clinical aspect of ankylostomiasis was to me the recognition of a series of, as far as I know, unrecorded psychopathological symptoms characterised by, so to speak, a "spectrum" of deeper and deeper immoral qualities,

growing and strengthening with the progress of the disease

It is difficult to determine whether there is *per se* vicarious appetites of the moral and mental systems parallel to those of the physical order, or if the moral and mental aberrations to be observed in an outbreak of this disease are merely accidental. My own belief is that they are as definite symptoms of positive nerve poisoning as anaemia is of blood destruction. But just as good food and general hygienic environment retards the progress of physical symptoms, so, too, moral surroundings will retard the growth of, and probably counteract tendencies to, degenerate habits. Children love to eat earth so much, that they disobey their parents' commands to refrain from indulgences of that sort. *Disobedience* thus forms the first colour in the moral spectrum, *cunning* soon follows, and, accordingly as punishment is administered or not, *lying* becomes a distinct symptom. The next stage of advancing immorality is a pronounced love of *stealing*. Children have told me that they enjoyed stolen food much more than that obtained in the usual manner.

Later stages of degeneration are of the sexual order. Schoolmasters have consulted me as to the cause of general demoralisation among school children. Thymol provided a key to the difficulty, with, I am glad to say, happy results. One boy who stole money from my house on two occasions, and confessed to further depredations, regained normal feelings of honesty and uprightness by treatment also with thymol.

A young girl of highly imaginative character, under the influence of the disease, forged letters to her mother, a widow, setting forth proposals of marriage from supposed admirers, coupled with the information that she must be kind and lenient, even indulgent, to her charming little daughter. This charming little daughter went so far with her forging propensities, that it was necessary to take steps to stop her. I recommended thymol as a first "punishment," which resulted in the expulsion of quantities of ankylostomes, and, later on, regeneration of character slowly ensued.

Another little maid of nine summers developed a faculty for finding half-sovereigns. One of these happened to be a coin which I had marked, and missed. Nothing was said to the child, but thymol having been exhibited, with the usual result, careful watch was kept for developments. In order to study her case, it was arranged that the girl should stay with my servants for some months, and from being quite the "naughtiest" girl at school, she grew into a really bright and lovable child.

Two factors are necessary, in my opinion, to produce effects of this nature: (1) A weakened physiology of the victim, and (2) an exciting nerve toxin. This part of the work I intend to follow up in one of the laboratories of Europe, and possibly may have more to say on the subject at some future date. At present the matter is too much in theory, but clinical indications seem very strongly to show that there may be a rational explanation of child immorality.

An editor of a local paper, who was at the same time a member of my hospital committee, communicated to the Press some of the information tabled from

month to month on the subject. The result brought a flood of letters to me from all parts of Australia, letters which proved clearly that ankylostomiasis was fairly distributed over the continent, although not with such virulent outbreaks as those I was personally in touch with in Queensland. To test several of those distant cases I sent thymol, and received back in due course specimens of the required nematode worms.

Australia has been infected by ankylostomiasis through three distinct channels—by South Sea Islanders, Arabians, and Italians. My brother, Dr W C C Macdonald, of Ingham, Queensland, relates how an Italian went to him from Pisa Hospital, where, rather strange to say, his case had not been diagnosed. The man had relations at Ingham who had been victims of the disease, and, hearing of their experience, he "diagnosed himself," and set out for Queensland, and in due course returned with a bottle of ankylostomes. In all probability the natives of Australia were affected by this parasite before the advent of the white race, for it may be found among them now, and several outbreaks have been recorded.

It is comparatively an easy matter to treat individuals, but how to stamp out the disease in communities is the question we still have to face. In my district, being medical officer to the General Hospital as well as to surrounding plantations with special local hospitals, I had a good opportunity of testing the prevalence of this disease when thoroughly engrafted into a community.

During this time the farming class passed through a transitional period from almost poverty to great prosperity, and advantage was taken when new farm homes were being built to treat all members of the home to thymol within a week, to disinfect as thoroughly as possible, and, finally, to burn old houses. In this way many centres of infection were, for the time being, obliterated. But, alas! how quickly new centres arise! Still, with reasonable assistance from Society, whether by way of Government grants or voluntary contributions, the outlook is far from hopeless.

The treatment of *definite contacts*, whom I should classify as those staying under the same roof, is an important matter in checking the development of community infection.

A splendid factor in my own efforts was the assistance rendered by the children, who really knew more of the disease than their elders would imagine. They gradually became quite learned in symptomatology, and entered enthusiastically into detection work. In this manner earliest symptoms were often noted in very young children, and information spread from one child to another. A child who has once passed through the pangs, sorrows, and miseries of an attack of ankylostomiasis, develops keen sympathy with others so affected. There is an unwritten tragedy in then young lives never to be forgotten.

It is much to a child to lose all desire for food and play, to grow weak and breathless and to swell with ascitic fluid, to see other children pine and die, to sit in listless groups, and, in addition, often to suffer punishment for weakened memory, the only excitement in their lives to be of a morbid nature.

The faces of children victims of ankylostomiasis can never be forgotten, a world of woe is engraved thereon in saddest lines, and those unhappy pictures nerve one on to unceasing efforts to do one's own part, and to arouse Society to a sense of its responsibility in the great fight against disease, more especially where duties are apparent, and the issue plain, as it is in the battle against ankylostomiasis, which is not a local matter, not even national, it is most emphatically an international question.

In conclusion, who knows what nations may not have been swept away in the slow waves of Time, done to death by the insidious poison of this subtle disease. Who knows but that the original serpent of evil was none other than the *I duodenale*.

Dr. LOUIS SAMMON, in opening the discussion, thought it would be of interest if he stated that ankylostomiasis was exceedingly frequent in various parts of Italy, especially in the sulphur mines, where Dr. Tuelh had recently made some very interesting observations. It was well known that whilst certain mines were very much affected with ankylostomiasis, others were comparatively free. Dr. Tuelh, who was a specialist in chemistry, made analyses of the waters in the different mines, and found that in the mines where the infection was greatest the water contained a very small percentage, if any, of salt, whilst in the mines that were free from infection the water contained a very high percentage of salt. As a result of his observations, the experiment was being made of salting the water in the infected mines.

Dr. F. M. SANDWITH thought all the members would keenly sympathise with the author, who must know, however, that he was not the only person who had preached in vain to municipal authorities. It was interesting to notice that the Italian case he had mentioned came from Pisa, the very city where Dr. Sorsino had done such excellent work in connection with ankylostomiasis. Perhaps in time the authorities would listen to their preaching. If not within the lifetime of those present, at any rate within the course of a generation or two the world would understand that what medical men were talking about to day was often right. The moral characteristics of the disease, which were so satisfactorily dispelled by the author's treatment, were interesting to anyone who had studied anaemia due to any cause—the ordinary neurotic person in this country, a person always of the suffragette sex, who developed very odd tastes. Earth hunger, which so far as he knew personally was not very common in this country, had the analogue here of young girls eating dry tea and dry rice. While they would turn up their noses at a rice pudding, they would eat quantities of dry rice. There were records in existence of cases of people taking down the mortar from the walls and eating it, and one of the oddest cases he had ever come across was that of a young girl who swallowed small pieces of dry sponge, which must have filled her up in a very uncomfortable way. It was all due to a morbid desire to get the stomach scratched, just in the same way as the adult patients of Dr. Macdonald took pickles, curries, and alcohol. Thymol was the universal drug for ankylostomiasis for many years. He heard it had done great things in Ceylon and Assam, so that he naturally introduced it into Egypt, and

successfully proved there that thymol acted very much better than any other vermifuge. But since those days a new drug had sprung up, which, he believed, Mons, a Belgian, was the first to introduce, namely, eucalyptus with castor oil and chloroform, which certainly was a much safer remedy. It seemed to get rid of the disease just as well as thymol, and it never killed the patient, which thymol in large doses did, especially if the patient was over 60 years of age and had fatty degeneration of the kidneys. On his last visit to Egypt, within the last eighteen months, his old hospital nurse told him they infinitely preferred eucalyptus to thymol because it was not necessary to watch the patients, whereas with the thymol it was necessary to do so in order to take care that they did not get up out of bed. In the delicate hint the author gave with regard to children and schoolmasters, he presumed a reference was made to sexual immorality. If there was one thing ankylostomiasis seemed to do it was to produce impotence in adults, so that it was very interesting to hear that children, before they were cured, were possibly suffering from an expiring effort of the sexual system to indulge in vicious habits before their powers left them. It would also be of interest if the author stated in his reply what was the youngest child he had ever seen suffering from the disease. Probably many of the children became infected with the larvae of the worm through eating mud, and therefore a child in arms, who could not crawl, could not become infected in that way. If the author knew of cases of sucklings developing ankylostomiasis it would be of extreme interest, because directly a child was 18 months or 2 years old it could crawl about, and was then exposed to practically the same risks as an adult.

Dr. R. T. LEIPER, in dealing with the question of earth hunger, enquired whether the author had observed if beneficial results followed from the habit of eating earth. He had recently noticed that some of the lower animals, which were infected with closely-allied forms of ankylostomiasis caused by parasites related to the ankylostomum nostoma, had a habit of eating earth. He observed in Uganda that it was quite common among elephants, and he found they were infected to an enormous extent with a form of ankylostomiasis. It was well known in the Tropics, such as East Africa, that earth eating was so prevalent that official means had been taken to prevent the sale of special forms of earth which were desired by the natives. Were those official warnings correct? Was it known in what manner earth affected the ankylostoma? The author had laid great stress upon the occurrence of ankylostoma in children in relation to the sexual precocity it produced. He would like to know whether Dr. Macdonald observed that a similar affection was caused also by the oxyurus. If that occurred in children, it possibly might explain some of the precocious sexual habits which he thought were due to the ankylostomiasis, and which Dr. Sandwith was inclined rather to discredit.

Dr. ALEX. M. ELLIOTT remarked that he had listened with great pleasure and interest to the paper because ankylostomiasis was very prevalent in certain districts in India, where he worked for some years, particularly in the district of Vellore, near Madras.

At the Kola goldfields, which were mainly worked by coolies, every coolie, sooner or later, appeared in the hospital, and, having examined probably many thousands of them, he had never found one who was not affected with ankylostomiasis. English miners were also employed at the same mines, and usually not six months elapsed after they commenced work before they appeared in hospital with symptoms of ankylostomiasis, having become infected from the natives. In other parts of the fields where the Malayalam coolies were not employed, although the disease was present to a certain extent, it was not nearly so prevalent amongst the white miners as in the mines where the Malayalams were employed. Dr Sandwith had mentioned the use of eucalyptus in the treatment of ankylostomiasis. He remembered the case of a white miner who was very severely infected some years ago in India, the blood-count being under 2,000,000, the eosinophilia 20 per cent, and the colour index about 12. He had been treated on several occasions, first of all with calomel and then with thymol. He then heard that if the patient was first of all prepared with podophyllum it had some peculiar effect on the mucous membrane of the ileum, which allowed the ankylostomes to be detached more easily than if they had been treated with calomel. He put a man for a week on podophyllum and subsequently gave him thymol, and where previously they had only got one or two ankylostomes, in the first wash subsequent to the podophyllum 183 were got away, and altogether about 500 in a week. The man made such rapid progress that very soon afterwards he was taken on under another three years' agreement. After that case he gave up using calomel with any other purgative, putting the patients on podophyllum previous to treating them with thymol, and invariably with very good results.

The PRESIDENT asked the author if he had ascertained what species of ankylostomes he was dealing with in Northern Australia, and also whether he found it associated, as it so often was, with anæmia. None of the speakers had referred to the use of beta naphthol as an anthelmintic in ankylostomiasis, but he understood it was the usual drug now employed by the Americans in their campaign against the disease in Porto Rico, given practically in the same dose and in the same way as thymol. He had had very favourable experience of the combination of eucalyptus oil, chloroform, and castor oil, which Dr Sandwith had mentioned. He had given it to patients who had experience of the thymol treatment, men by experience qualified to judge the merits and demerits of the respective drugs, and they uniformly agreed that the eucalyptus and chloroform combination was infinitely less disagreeable than the thymol. He wished some of the speakers had brought forward suggestions as to the management of ankylostomiasis viewed as an epidemic or endemic disease, because he believed it was the intention of the Colonial Office, following the example of America in the case of Porto Rico, to attempt to systematically deal with the subject in the West Indian colonies. An endeavour was to be made to collect information as to the state of the coolies and the inhabitants in regard to ankylostomiasis through all the West Indian colonies, and to ask for advice or

suggestions as to the best way of attacking the subject from a general point of view. If any of the members possessed any information which would help him to advise on such a subject, he would be exceedingly grateful to receive it. The way in which the author traced the immortality to the presence of the ankylostome in the intestinal canal was very interesting, and was an object-lesson as to the importance of a healthy body for producing a healthy mind. He had noticed once or twice that children who had been the subjects of intestinal parasitism developed the habit of lying. He remembered in particular a child, who was evidently the subject of some worm infection, who was in the habit of crawling upon the verandah and picking the lime out from between the slabs of bricks and tiles and eating it, and when scolded by the nurse for eating the stuff the child would insist that she had never eaten it at all. The habit of lying gradually grew in a child until it began to look on it as a virtue. It was possible to understand from a concrete example of that kind how ankylostomiasis led to immortality.

Dr MACDONALD, in reply, thanked the members very much for the very courteous criticism of his paper. As they could easily imagine, he had to leave out a very great deal more than he put in, his difficulty being to know what would prove most interesting. He thought the moral question would be freshest, and therefore he emphasised it so pointedly in his paper, as he was anxious to have some discussion on that point. In answer to the President's question as to the identity of the organism, he had found both the *Necator americanus* and the *Ankylostomum duodenale*, and he believed there was a third species, but he was not quite expert enough to be certain. Unfortunately, his visit to England had only been indirect, he came through New Zealand, intending to return to Queensland and bring his specimens with him. He had, however, asked for his specimens to be sent home, and he would then have an opportunity of examining them under expert criticism. In reply to the President's second question with regard to anæmia, he knew it had been noticed in Melbourne, although he had not found it himself. He might perhaps excuse himself if he stated that he had at the time to rush the treatment of the ankylostomiasis. There was little time for scientific investigation, but it was of intrinsic importance that the disease should, if possible, be stamped out from the district. Consequently, having established a routine method of treatment, as soon as he ascertained that there were symptoms he had the patient treated, and he had seldom time to investigate afterwards what shape and form the organism took. But at the beginning he paid a great deal of attention to the subject, and knew there were the two forms of *N. americanus* and *A. duodenale*. He was glad to hear that both the President and Dr Sandwith endorsed the idea of giving eucalyptus combined with chloroform. That was a considerable satisfaction to him, because his experience of thymol proved to him that it was a dangerous drug and required the greatest possible care, especially in very young children, whom he mostly had to deal with. He had to invent an instrument for giving small capsules, something in the form of

Colonial Medical Reports.—No. 2.—Bermuda.

MEDICAL REPORT FOR THE YEAR 1906

By ELDON HARVEY,

Medical Officer of Health

THE estimated civil population, taken from the Registrar General's Annual Report which has just been published, was, at the end of 1906, 19,588—consisting of 6,877 white and 12,711 coloured—a decrease as compared with 1905 of 621 persons. The births numbered 734 and the deaths 457.

The living birth-rate was 37.4 per 1,000, as compared with 36.8 in 1905, 38.6 in 1904, 35.6 in 1903, 34.8 in 1902, 37.7 in 1901, and 36.3 in 1900.

The death rate was 23.3 per 1,000, as compared with 19.9 in 1905, 20.8 in 1904, 23.2 in 1903, 22.3 in 1902, 21.8 in 1901, and 21.3 in 1900. The death rate during the period under review according to colour was 19.6 per 1,000 amongst the resident white and 25.6 amongst the coloured population.

Five deaths occurred from diphtheria and 10 from enteric fever. Twenty-four cases of diphtheria and 43 of enteric fever were reported to me during the year.

With the exception of a recrudescence of diphtheria during the last quarter of the year, the state of the public health during 1906 was eminently satisfactory.

During the first quarter of the year 10 cases of sporadic diphtheria occurred, with 1 death. Throughout the summer no fresh cases were reported to me, but a recrudescence of the disease occurred during the last quarter, with 12 cases—3 of them died. The premises where these cases occurred were kept in quarantine throughout the illness and subsequently disinfected.

During the months of June and July I made inspections of tinned foods imported here from America. I found very few of the tins had the Government label or any date on which the food was prepared, which is most important and desirable in hot climates. Old stock is occasionally sold here at auction, but the large firms of meat packers keep agents to look after their interests, and it is the agents' duty to see that blown or damaged tins are not offered for sale. Putrefaction of the contents may take place and no bulging be noticed, sufficient gas not having been formed. Blown tins are apparent to all, and when opened the contents are offensive. The agents will make good to the importer any tins that are blown. Blown tins are said to be destroyed and buried in the ground, the only use which I can discover they have been put to is baiting fishpots. From such information as I have been able to collect I am of the opinion that no examination of tinned foods is possible in this colony, we have to depend on the vigilance and integrity of the authorities supervising the canning of goods in the United States and elsewhere.

The milk supply of the city of Hamilton has had

my best attention and inspection for many years. During the year I visited the principal dairies throughout the Colony, especially those supplying the city of Hamilton, and took samples of the milk. The average percentage composition of good milk is about as follows: water, 87.17, fat, 3.69, solids other than fat, 9.14, total 100.00. Taking this as my standard of good milk, and then comparing it with the samples I collected haphazard, I found, taking into consideration the peoiness of the pasture, that they were as good as could be expected, and satisfactory for general consumption. In some countries standards have been fixed, below which it is unlawful to sell milk—3 to 3½ per cent of fat and 12 per cent of total solids is required—but the sale of milk here is so general or common to the whole population that I doubt very much if any law on the subject would be effective. It seems to me the public have a better right to demand cleanly conditions. Conditions of the milking place, washing of the cow's udder and teats, preparatory toilet of the milker, clean storage and distribution tins, carts, &c., and it is in these directions my labours have been more particularly engaged. Cows can only be kept in the city of Hamilton on my permit, and I have been careful to see that the inspector examined the condition of the premises where the cow is to be kept before permission is granted.

Enteric fever, common in this place, can no doubt, under certain conditions, be spread by the water added to the milk, but that tuberculosis is contracted by drinking the milk of a cow that has responded to the tuberculin test has been and is a much disputed question. Cows with well-marked tubercular ulcerations of the udder are considered by all to be dangerous to the public health, and I have instructed the inspectors to inform me of any such diseased cows coming under their notice. The general conditions of the abattoirs and bakeries here compare very favourably with those I have seen abroad.

During the last quarter of the year, assisted by Capt. Wanhill, principal sanitary officer, R.A.M.C., I delivered a course of lectures to school teachers and others on hygiene and temperance as outlined in a pamphlet issued by the Board of Education of England, local points and local conditions receiving due attention, diagrams and blackboard drawings being freely used. Mr. George Simpson, inspector of schools, was present. At the end an examination paper with a number of questions was issued to be answered at home.

The public vaccination officers were paid for 397 successful vaccinations during the year.

The most important event in the history of the year

was the refusal of the House of Assembly to adopt the quarantine regulations arranged at the Inter colonial Conference held in Barbados, April, 1904. When the finances of the Colony are in a better condition than at present, no doubt this whole question will be reconsidered.

Sanitary Inspection

Under this heading are characterised all those premises visited by me to investigate complaints where nuisances were claimed to exist. This class of inspection includes buildings of every description, as well as vacant property. There was thus a thorough supervision exercised along those lines, and much good work done.

I have frequently visited the meat markets during the year, and on every occasion I have found them clean and satisfactory.

The largest and most important slaughter and ice houses have been regularly visited and inspected once every week during the past year, and I am pleased to report that the work in all departments of this establishment is up to date, clean and satisfactory. •

To the largest and most important dairies I have

made frequent visits and inspections. The work is conducted on the best known lines. The cows are well housed, well fed, and well supplied with pure water.

To the stables that are situated in the city I have made frequent visits and inspections, all of which are usually satisfactory.

There have been a number of superior class dwelling houses erected and others remodelled during the past year. In most of these houses there have been installed all modern conveniences, all of which have been constructed in a workmanlike and satisfactory manner.

From the streets, wharves, and shore line the carcases of dead animals, &c., have been collected and carefully buried so as to prevent a nuisance, and also a danger to the public health.

In conclusion, I may say that the work of the parish cleaning has been somewhat irregular, and in some cases not very satisfactory. I trust, however, within a very short time, to have a monthly systematic cleaning.

JOHN F. MOTYER,
Sanitary Inspector

Colonial Medical Reports.—No. 3.—Gambia.

MEDICAL REPORT FOR THE YEAR 1906

By R. M. FORDE,

Senior Medical Officer

The total number of cases treated at the hospital during 1906 was above the average of the past two years, there being 1,075 more cases treated, and the greatly improved facilities for the treatment of the sick seem to be highly appreciated by the public in general. The following tables show the number of in patients and out-patients —

PATIENTS IN HOSPITAL				
	Remaining in Hospital 1905	Admitted in Hospital during the year	Died	Remaining in Hospital 1906
Europeans	—	23	1	—
Natives	18	389	28	9
Civil Police	2	38	2	—
W A F F	4	82	—	1
Syrians	—	14	—	—
Total	24	546	31	10

RESULTS OF TREATMENT, &c

	Male	Female	Total
Patients remaining in Hospital, 1906	16	8	24
Do admitted during the year	371	175	546
Total	387	183	570
Cured	193	128	321
Relieved	158	45	203
Not Relieved	3	2	5
Died	26	5	31
Remaining in hospital, 1906	7	3	10
Average stay in days of patients discharged	14	10	—
Average stay in days of patients died	10	5	—

The deaths were due to the following causes: Abscess of colon, 1, chronic asthma, 1, diarrhoea, 2, blackwater fever, 1, concussion of the brain, 1, dysentery, 1, bronchitis, 2, debility, 1, exhaustion, 1, intermittent fever, 1, meningitis, 2, morbus cordis, 4, paralysis, 2, pneumonia, 2, phthisis, 1, rheumatism, 1, senile decay, 1, sleeping sickness, 3, starvation, 1, tetanus, 2.

GENERAL DISEASES

GENERAL DISEASES				GENERAL DISEASES—continued			
	Admissions	Deaths	Total Cases Treated		Admissions	Deaths	Total Cases Treated
Alcoholism	2	—	2	Other Tubercular Diseases	3	—	3
Anæmia	2	—	2	Varicella	—	—	—
Anthrax	—	—	—	Whooping Cough	—	—	—
Beri beri	—	—	—	Yaws	—	—	—
Bilharziosis	—	—	—	Yellow Fever	—	—	—
Blackwater Fever	2	1	2				
Chicken-pox	—	—	—				
Cholera	—	—	—				
Cholerae Diarrhoea	—	—	—				
Congenital Malformation	—	—	—				
Debility	2	1	2				
Delirium Tremens	—	—	—				
Dengue	—	—	—				
Diabetes Mellitus	—	—	—				
Diabetes Insipidus	—	—	—				
Diphtheria	—	—	—				
Dysentery	2	1	2				
Enteric Fever	—	—	—				
Erysipelas	—	—	—				
Febriæula	4	—	4				
Filariasis	—	—	—				
Gonorrhœa	11	—	11				
Gout	—	—	—				
Hydrophobia	—	—	—				
Influenza	—	—	—				
Kala Azar	—	—	—				
Leprosy	—	—	—				
(a) Nodular	—	—	—				
(b) Anæsthetic	—	—	—				
(c) Mixed	—	—	—				
Malarial Fever—	—	—	—				
(a) Intermittent—	44	1	47				
Quotidian	—	—	—				
Tertian	—	—	—				
Quartan	—	—	—				
Irregular	—	—	—				
Type undiagnosed	—	—	—				
(b) Remittent	16	—	16				
(c) Pernicious	—	—	—				
(d) Malarial Cachexia	—	—	—				
Malta Fever	—	—	—				
Measles	—	—	—				
Mumps	—	—	—				
New Growths—	—	—	—				
Non malignant	—	—	—				
Malignant	—	—	—				
Old Age	1	1	1				
Other Diseases	3	2	3				
Pellagra	—	—	—				
Plague	—	—	—				
Pyæmia	—	—	—				
Rachitis	—	—	—				
Rheumatic Fever	—	—	—				
Rheumatism	11	1	12				
Rheumatoid Arthritis	—	—	—				
Scarlet Fever	—	—	—				
Scurvy	—	—	—				
Septicæmia	—	—	—				
Sleeping Sickness	5	3	6				
Sloughing Phagedæna	—	—	—				
Small pox	—	—	—				
Syphilis	—	—	—				
(a) Primary	—	—	—				
(b) Secondary	—	—	—				
(c) Tertiary	—	—	—				
(d) Congenital	—	—	—				
Tetanus	4	2	4				
Trypanosoma Fever	—	—	—				

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VACCINATION

A total of 10,726 vaccinations were performed during the year, imported glycerinated calf lymph being exclusively employed, of these, 5,757 were primary vaccinations, of which 5,453 were successful, 105 unsuccessful, and 199 not accounted for. 4,969 re-vaccinations were performed, of these, 3,314 were successful, 1,068 unsuccessful, and 587 not accounted for. To this regular vaccination and re-vaccination since the occupation of the Island should be largely attributed the restriction of an extensive outbreak of small pox.

QUARANTINE

I am pleased to record that, with the exception of a medical inspection and disinfection of the effects of third class passengers, as also susceptible goods on arrivals from Egypt, Beyrout, and Adalia, it was not found necessary to enforce any quarantine during the year under report.

this branch, particularly in connection with Food and Drugs Act, which came into force at the commencement of the year.

Total cases treated in the six district dispensaries were as follows: General diseases, 8,704, local diseases, nervous, 301, local diseases, other, 10,139, injuries, &c, 864, total, 20,008.

The total number of cases treated in the eleven rural divisions, together with Tricoma, were: General diseases, 3,642, local diseases, nervous, 440, local diseases, other, 3,921, injuries, &c, 639, total, 8,642.

NICOSIA

Report by Dr R A Cleveland, District Medical Officer

The general health of the inhabitants of the town and district has been satisfactory.

Towards the latter part of the year there was a serious outbreak of whooping cough, chiefly confined

NICOSIA METEOROLOGICAL RETURN FOR THE YEAR 1906

Months	TEMPERATURE						RAINFALL		WIND	
	Solar Maximum	Minimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in Inches	Degree of Humidity	General Direction	Average Force
January	—	—	58.2	37.6	20.6	47.9	2.02	78.8	S W	0.9
February	—	—	61.0	41.4	19.6	51.2	2.36	78.3	N	1.0
March	—	—	66.4	41.9	24.5	54.2	1.50	76.7	S W	0.9
April	—	—	74.8	47.9	26.9	61.4	1.25	65.7	S W	1.1
May	—	—	76.6	53.3	23.3	65.0	2.35	71.7	W	1.2
June	—	—	89.7	62.3	27.4	76.0	0.67	56.7	W	2.3
July	—	—	97.6	67.9	29.7	82.8	0.00	56.1	W	2.1
August	—	—	98.3	66.8	31.5	82.6	0.02	58.5	W	1.5
September	—	—	91.8	62.3	29.5	77.1	0.00	54.9	W	1.8
October	—	—	84.6	55.4	29.2	70.0	0.00	60.3	W	1.2
November	—	—	73.7	47.7	26.0	60.7	2.92	76.5	W	1.1
December	—	—	62.4	46.3	16.1	54.4	3.15	85.3	W	1.2
Total	—	—	77.9	52.6	25.3	65.3	16.24	68.3	W	1.4

Owing to the new harbour at Famagusta, and the mail and other steamers calling there, a health officer has been appointed, and a disinfecting apparatus established, in order that free pratique may be granted when medical inspection with disinfection is imposed.

ANIMAL DISEASE

The veterinary surgeon reports that the disease in the Island for the past year has not been serious.

Sheep and goats, variola or pox or scab, oxen, quarter-ill and anthrax, and in one case, tuberculosis, suspected. He reports also that there have been a few cases of rabies.

CHEMICAL LABORATORY

I submit the report of the Government Analyst for the year. There has been considerable work done in

to children. The disease seems to have been brought from Limassol, and very few children seem to have escaped. It was severe in type, but no case of death from the disease has been recorded here.

In the month of November a case of well marked small-pox appeared in Nicosia Town, and later an isolated case was found in the village of Peristerona. Isolation and quarantine measures were adopted, and disinfection and vaccination were carried out, with the result that beyond the two cases no further case occurred. Both cases recovered. It has not been possible to trace the origin of the outbreak.

No case of diphtheria was reported during the year. Typhoid fever was responsible for three deaths in hospital, and there were 15 cases treated. The disease seems to be fairly prevalent throughout the Island. The disease is generally of a mild type.

The following table gives the total cases treated at Nicosia Central Hospital and Central Prison Hospital

Years	No	Deaths	No of Widal tests applied	Positive	Negative
1900	6	1	0	—	—
1901	11	2	0	—	—
1902	18	5	0	—	—
1903	8	2	0	—	—
1904	11	1	0	—	—
1905	8	3	9	7	2
1906	18	3	16	13	3

It will be observed that the new means of diagnosis of this disease is adopted, viz, the Widal reaction, in all cases admitted, and it is found to be of the greatest use in diagnosis

There has been a marked decrease in the number of cases of malarial fever during the year. There are 308 cases recorded in the out-patient department during the year, against a total of 602 in the previous year. I beg to refer to my remarks under this head in my Annual Report for 1905, and I venture to think in some measure the reduction in the number of cases can be attributed to the measures that are being taken in the town during the summer months.

The appointment of Dr Yuannides as Rural Medical Officer attached to the Nicosia General Hospital has been of the greatest service in carrying on the work of the institution, and especially in operative work. He pays a weekly visit to the district, taking drugs, instruments, and dressings with him, and the villagers are glad to avail themselves of his services.

GENERAL HOSPITAL

This hospital has done good work during the year. The buildings were repaired and repainted during the year, and are now in good condition. As mentioned in my report last year, the floors of the wards and the absence of proper accommodation for women are much needed improvements. It is now many years since I first advocated an extension of the hospital, so as to provide for the expansion of the hospital.

A considerable amount of operative work was carried out during the year. A total of 192 surgical operations with only 5 deaths are shown in the annual returns. Of these 49 were major operations, chloroform, cocaine, and ether spray being used as anæsthetics in all but very slight cases. Chloroform was given in 82 of these operations.

Table showing the total number of civilians, police, and prisoners treated as in- and out patients at the Nicosia General and Central Prison Hospitals during the year —

	Civilians	Deaths	Police	Deaths	Prisoners	Deaths	Total
In patients	254	19	253	2	58	1	563
Out patients	5,157	—	816	—	307	—	6,280

There were 22 deaths amongst the in patients.

Table showing the above total and those of previous years —

Year	Total No of in and out-patients	Deaths
1900	5,511	31
1901	5,939	22
1902	6,568	25
1903	6,769	20
1904	7,297	22
1905	6,937	29
1906	6,845	22

No patient is counted more than once in the above

returns, but a total of 4,025 subsequent visits were paid during the year.

A total of 4,677 dressings in minor surgical cases were applied in the out patients' department.

The number of prescriptions made up during the year were 22,013.

Report by Dr G A Williamson, District Medical Officer

In submitting the statistics for 1906 referring to Larnaca, it may be remarked that the diseases most frequently occurring are those commonest also in preceding years: malaria, influenza, rheumatism, anæmia, debility, diseases of respiratory and digestive systems, of the cellular tissues of the skin, while cases of syphilis and gonorrhœa still come for treatment in considerable number. An interesting and agreeable fact is the great rarity of malignant disease (cancer), only one case presenting itself. Malaria was not so prevalent as in 1905, but far more so than would be the case were the people to take the advice given them daily as to the simple methods of prevention of infection.

ABUSE OF HOSPITAL

As in former years, the hospital continues to be not only used but also abused by the people, many persons coming for treatment who could quite well afford to pay for medical attendance, and many also who have done so, but thought they would like a change of doctor, and so came to the hospital, where they would not have to pay. It is to be feared that those who have the privilege of granting letters of recommendation for the hospital are not always so careful to send necessitous cases only as might be desired or expected. Both private practitioners and chemists have complained of this abuse, taking from both, as it does, their clients. It is difficult to put a stop to, as the District Medical Officer only sometimes knows the financial circumstances of the out-patients, and generally it is not till after the patients have been seen and medicine given that the real state of affairs comes to his ears.

INFECTIOUS DISEASES

Epidemics occurred of whooping cough, influenza, and, in outlying villages of the district, measles. The whooping cough was widespread, and several distressing cases were met with in adults. Enteric fever was present in sporadic form only, 6 cases in all having been seen during the year. This is a great matter, as, with the low-lying position of Scala, with cesspools, very indifferently preserved water-pipes, the presence of one case in the centre of the town is very generally followed by many more. Of course there were more than 6 cases in the town, the 6 merely representing those encountered in the out-patient room, but as enteric fever is not a notifiable disease, its occurrence in the practice of private practitioners cannot be known.

Two very mild cases, diagnosed as diphtheria, occurred in adults in the practice of one private practitioner, and both recovered in the course of a few days. In the late autumn several cases closely resembling diphtheria were seen at the hospital, but

RETURN OF DISEASES AND DEATHS IN 1906 AT THE SIX HOSPITALS, INCLUDING THE LUNATIC ASYLUM
AND LEPER FARM, IN Cyprus

GENERAL DISEASES				GENERAL DISEASES—continued			
	Admis sions	Deaths	Total Cases Treated		Admis sions	Deaths	Total Cases Treated
Alcoholism	1	—	1	Other Tubercular Diseases	—	—	—
Anemia	7	1	9	Varicella	—	—	—
Anthrax	—	—	—	Whooping Cough	—	—	—
Beri beri	—	—	—	Yaws	—	—	—
Bilharziosis	—	—	—	Yellow Fever	—	—	—
Blackwater Fever	—	—	—				
Chicken pox	—	—	—				
Cholera	—	—	—				
Choleraic Diarrhoea	—	—	—				
Congenital Malformation	—	—	—				
Debility	11	—	34				
Delirium Tremens	—	—	—				
Dengue	—	—	—				
Diabetes Mellitus	1	—	2				
Diabetes Insipidus	—	—	—				
Diphtheria	—	1	—				
Dysentery	31	—	32				
Enteric Fever	23	5	25				
Erysipelas	8	—	8				
Febricula	2	—	2				
Filariasis	—	—	—				
Gonorrhoea	27	—	28				
Gout	—	—	—				
Hydrophobia	—	—	—				
Influenza	53	1	59				
Kala Azar	—	—	—				
Leprosy	—	—	—				
(a) Nodular	—	—	—				
(b) Anæsthotio	—	—	—				
(c) Mixed	—	—	—				
Malarial Fever—	—	—	—				
(a) Intermittent	—	—	—				
Quotidian	90	—	92				
Tertian	23	—	24				
Quartan	18	—	18				
Irregular	8	—	8				
Type undiagnosed	38	—	39				
(b) Remittent	31	—	31				
(c) Pernicious	7	1	7				
(d) Malarial Cachexia	—	—	—				
Malta Fever	—	—	—				
Measles	—	—	—				
Mumps	—	—	—				
New Growths—	—	—	—				
Non malignant	5	—	6				
Malignant	10	—	10				
Old Age	—	—	—				
Other Diseases	—	—	—				
Pellagra	—	—	—				
Plague	—	—	—				
Pyæmia	1	1	1				
Rachitis	—	—	—				
Rheumatic Fever	7	—	7				
Rheumatism	34	—	38				
Rheumatoid Arthritis	—	—	—				
Scarlet Fever	—	—	—				
Scurvy	—	—	—				
Septicæmia	1	1	1				
Sleeping Sickness	—	—	—				
Sloughing Phagedæna	—	—	—				
Small pox	1	—	1				
Syphilis	—	—	—				
(a) Primary	17	—	20				
(b) Secondary	10	—	10				
(c) Tertiary	—	—	—				
(d) Congenital	1	—	1				
Tetanus	2	1	2				
Trypanosoma Fever	—	—	—				
Tubercle—	5	—	5				
(a) Phthisis Pulmonalis	—	—	—				
(b) Tuberculosis of Glands	—	—	—				
(c) Lupus	—	—	—				
(d) Tabes Mesenterica	—	—	—				
(e) Tuberculous Disease of Bones	—	—	—				

bacteriological examination of the exudate of the throat did not warrant the diagnosis of diphtheria, and all got well in a very short time

Tubercular disease continues to be seen, chiefly as pulmonary tuberculosis, but fortunately the cases are not very numerous. The greatest difficulty occurs in preventing danger of its being communicated to those living with the patients, as very often there is only one room for the family to live in and isolation is consequently impossible, reliance therefore having to be placed on separation of the patient's personal belongings and clothing, the destruction of the expectorations, and the use of disinfectants

WATER SUPPLY

It is satisfactory to know that the water supply of Larnaca is adequate and pure. Analysis of the water at its entrance to the town (at the Government garden) shows it to be of good quality, though a little hard. Unfortunately, however, the service pipes for the town are old, and allow of pollution of the water from leaky cesspools, &c, with the result that the water, which at the confines of the town gives a good result on analysis, at its distribution, in the midst of the town, especially in the poorer quarters (where little care is taken to preserve the water from further pollution in the yards), gives on analysis a very different result. The safest plan for the populace to adopt is, during the summer months at any rate, to boil or filter (in a reliable apparatus such as the Pasteur Chamberland or Berkefeld) the water to be used for drinking purposes, but the measures again cannot be followed by the very poor, thus for all classes the better preservation of the water-pipes, so as to prevent contamination of the water by organic pollution, is a matter greatly to be desired, but can only be obtained by very considerable expense

DRAINAGE

Except for a few surface water drains, drainage in the ordinary sense does not exist in Larnaca. Even these surface water drains have given a good deal of trouble. As long ago as 1900 it was recommended that the largest of these discharging on the beach in front of the Royal Hotel should be continued so as to discharge into the sea, and so do away with the abominable smell of decomposition that arose during the summer heat from the sand where soaked by the discharge. The municipal authorities, for some reason difficult to understand, would not listen to this simple suggestion, but spoke of bringing ventilating lamp posts which would be erected at intervals along the drain, at last, thanks to a largely signed letter from the principal inhabitants of the neighbourhood, action had to be taken, and in April a pipe continuation of the drain was placed in position, and by this means the water was discharged into the sea, instead of on to the beach, with the gratifying result that the summer stench did not appear. The adoption of this system for the remaining drains is now being urged, and there is some chance of it being carried out

VITAL STATISTICS

Vital statistics are again impossible to present owing to the absence of reliable information as to births, deaths, &c

BACTERIOLOGICAL EXAMINATION

Bacteriological examination continues to be done at the hospital and has proved of great use, especially the Widal reaction for enteric and Malta fevers, and blood examination for malaria

GENERAL HEALTH

Finally, the general health of the community during 1906 may be classed as good, though by no means so good as it might be were more care exercised in the preservation from impurities of the various articles of food and drink, in the prevention of the occurrence of puddles suitable for mosquito breeding, and in the intelligent use of the mosquito net

Report by Dr M Francis, Government Analyst and Lecturer in Chemistry

During the past year 456 samples were analyzed, and 22 bacteriological examinations were made for the Government, 145 preparations of a chemical or bacteriological nature were made during the year

The number of private samples analyzed was 21. The total amount paid into the treasury for this work was £9 18s

The following gives the number of samples received from all sources: Hon. Chief Secretary, 6, Chief Collector of Customs, 1, Chief Medical Officer, 10, Director of Public Works, 20, Director of Agriculture, 4, Principal Forest Officer, 9, General Railway Manager, 7, Commissioner—Napho, 1, Kyrenia, 3, Cyprus Police (Divisions)—Nicosia 239, Limassol 50, Famagusta 31, Larnaca 32, Kyrenia 19, Paphos 22, Municipality of Nicosia, 1, Officer Commanding Troops, 1, samples from private persons, 21, total, 477

In all 393 exhibits and samples of food and drugs were received from the police for analysis and examination, and on many occasions I gave evidence of a scientific nature in criminal and civil cases. I am pleased to report that there has been a reduction in the number of criminal exhibits. The new Food and Drugs law came into force on January 1, 1906, and during the year under report 280 samples of food and drugs were analyzed for the police. Of this number I found 152 to be pure and 128 adulterated. A considerable number of persons have been prosecuted and fined with good effect, and it is generally admitted that the quality of the food has greatly improved, and the percentage of adulterated samples decreased. The common adulterants used for milk are water, water and ground rice, and flour and sugar. I have found that the bread and flour contain a considerable quantity of sand and earthy matter, amounting in one instance to as much as 16 per cent. The presence of the sand is due to the whert and barley not having been previously cleaned before grinding, and also to the soft millstones used. I have also found considerable quantities of alum in food, and I consider this adulterant not only to be unnecessary, but injurious to health. It has been found very difficult to stop the addition of ground wheat to coffee, as the great difference in the prices gives a large profit to the vendor. This law is greatly appreciated by the public generally, and will do a great deal to improve the health of the people

This report shows that the amount of work done in the laboratory has greatly increased during the past year

Colonial Medical Reports.—No. 8.—Basutoland.

MEDICAL REPORT FOR THE YEAR 1906

By E. C. LONG,

Principal Medical Officer

POPULATION

In the absence of any system of registration of births and deaths, no information is available under this heading

PREVALENCE OF SICKNESS

The year under review was an average one as regards the general health of the population. There was an increase in the number of patients treated in the hospitals, traceable, not to the presence of an exceptional amount of sickness, but to increasing confidence in European medical treatment.

There were no epidemics of importance, small-pox was entirely absent throughout the territory. Whooping cough and measles were prevalent all through the year, and assumed an epidemic form in the later months. The type of disease was mild, and the mortality, as far as can be ascertained, low. Complications connected with these two complaints were rare. Tuberculosis and syphilis still figure largely in the returns, and a spread of the former disease may be looked for in future years, owing to the persistence of the causes set forth in previous reports. The glandular type of tuberculosis is still the most common, but, as patients readily submit to operative interference in the early stages of the disease, many cures are effected.

There has not been much enteric fever, and, as usual, most of the cases were imported from the various labour centres. The large number of cases returned as "febricula" were probably undiagnosed cases of measles.

It will be seen that there are no cases of leprosy mentioned in the horological return. A recourt of the lepers in the territory is in progress, and the subject will be dealt with in a supplementary report.

Rheumatism, chiefly the chronic form, has been very prevalent. It was especially so in the winter, which was exceptionally dry and cold. Dry seasons would appear to be more conducive to rheumatism than wet ones. The spring and early summer were very wet, the rainfall being far in excess of the average for recent years. Yet during these months the cases of rheumatism were comparatively few.

A fair number of cases of malignant disease were observed, and a consideration of the cases tends to the conclusion that malignant disease is more common than is usually supposed. Of the twenty-eight cases noted, two occurred in one clinic, and one is led to believe that if equal opportunities for observation occurred at other centres, an increased number would be brought to light.

Two cases of keloid (usually a benign growth) of a malignant type occurred, in which the lymphatic glands appeared to be secondarily affected. Photographs of these cases are attached, as also a photograph of a rare form of dermoid tumour which contained, in addition to bone and glandular masses, a rudimentary stomach and 18 in. of intestine. The tumour, which was present at birth, was attached by a broad pedicle to the temporal bone. It was successfully removed.

In a previous report it was mentioned that a trial of the method of subconjunctival injections for the treatment of eye diseases was being made. The results up to date have been distinctly encouraging, though not as good as those recorded by the introducer of the method. Marked benefit has been observed in cases of retinitis and optic neuritis.

Numerous cases of glaucoma are still observed, but most of the cases come too late for treatment. Most of the patients are elderly, and the disease appears to be equally common in both sexes. It is rare for young subjects to suffer from glaucoma, and its presence in a girl of 15 is sufficiently rare to be worth recording. In this case there was already marked cupping of the disc, and the disease, judging by the account given of the gradual failure of vision, had been in existence four years, making 11 years as the age when first attacked.

The general sanitary condition of the territory remains good, but in the locations situated in the Government reserves (magistracies) the question of sanitation will have to be tackled in the near future. There is a good deal of overcrowding in these locations, and the primitive sanitary arrangements of the average native village are apt to become a danger and a nuisance where large numbers of natives are living within a small area.

RETURN OF DISEASES AND DEATHS IN 1906 AT THE HOSPITALS, Basutoland.—

GENERAL DISEASES							
	Admissions	Deaths	Total Cases Treated		Admissions	Deaths	Total Cases Treated
Alcoholism	—	—	—	GENERAL DISEASES—continued			
Anæmia	—	—	224	Other Tubercular Diseases			
Anthrax	—	—	—	Varicella	—	—	39
Beri beri	—	—	—	Whooping Cough	—	—	49
Bilharziosis	—	—	—	Yaws	—	—	—
Blackwater Fever	—	—	—	Yellow Fever	—	—	—
Chicken pox	—	—	—				
Cholera	—	—	—				
Choleraic Diarrhoea	—	—	—				
Congenital Malformation	—	—	—				
Debility	1	—	268				
Delirium Tremens	—	—	—	LOCAL DISEASES			
Dengue	—	—	—	Diseases of the—			
Diabetes Mellitus	1	—	2	Cellular Tissue			
Diabetes Insipidus	—	—	—	Circulatory System—			
Diphtheria	—	—	10	(a) Valvular Disease of Heart			
Dysentery	6	1	21	(b) Other Diseases			
Enteric Fever	14	4	19	Digestive System—			
Erysipelas	2	—	9	(a) Diarrhoea			
Febricula	10	—	257	(b) Bill Diarrhoea			
Filariasis	—	—	—	(c) Hepatitis			
Gonorrhoea	—	—	415	Congestion of Liver			
Gout	—	—	18	(d) Abscess of Liver			
Hydrophobia	—	—	—	(e) Tropical Liver			
Influenza	—	—	186	(f) Jaundice, Catarrhal			
Kala Azar	—	—	—	(g) Cirrhosis of Liver			
Leprosy	—	—	—	(h) Acute Yellow Atrophy			
(a) Nodular	—	—	—	(i) Sprue			
(b) Anæsthetic	—	—	—	(j) Other Diseases			
(c) Mixed	—	—	—	Ear			
Malarial Fever—	—	—	1	Eye			
(a) Intermittent—	—	—	—	Generative System—			
Quotidian	—	—	—	Male Organs			
Tertian	—	—	—	Female Organs			
Quartan	—	—	—	Lymphatic System			
Irregular	—	—	—	Mental Diseases			
Type undiagnosed	—	—	—	Nervous System			
(b) Remittent	—	—	—	Nose			
(c) Pernicious	—	—	—	Organs of Locomotion			
(d) Malarial Cachexia	—	—	—	Respiratory System			
Malta Fever	—	—	—	Skin—			
Measles	—	—	325	(a) Scabies			
Mumps	—	—	11	(b) Ringworm			
New Growths—	—	—	—	(c) Tinea Imbricata			
Non malignant	68	—	142	(d) Favus			
Malignant	13	1	28	(e) Eczema			
Old Age	—	—	—	(f) Other Diseases			
Other Diseases	—	—	—	Urinary System			
Pellagra	—	—	—	Injuries, General, Local—			
Plague	—	—	—	(a) Striasis (Heatstroke)			
Pyæmia	4	1	6	(b) Sunstroke (Heat Prostration)			
Rachitis	—	—	—	(c) Other Injuries			
Rheumatic Fever	—	—	—	Parasites—			
Rheumatism	12	—	885	Ascaris lumbricoides			
Rheumatoid Arthritis	—	—	—	Oxyuris vermicularis			
Scarlet Fever	—	—	—	Dochm. duodenalis, or Auklo			
Scurvy	9	—	20	stoma duodenale			
Septicæmia	—	—	—	Draconculus medinensis (Guinea			
Sleeping Sickness	—	—	—	worm)			
Sloughing Phagedæna	—	—	—	Tapeworm			
Small pox	—	—	—	Poisons—			
Syphilis	—	—	—	Snake bites			
(a) Primary	—	—	10	Corrosive Acids			
(b) Secondary	—	—	538	Metallic Poisons			
(c) Tertiary	37	—	768	Vegetable Alkaloids			
(d) Congenital	—	—	301	Nature Unknown			
Tetanus	—	—	—	Other Poisons			
Trypanosoma Fever	—	—	—	Surgical Operations—			
Tubercle—	—	—	—	Amputations, Major			
(a) Phthisis Pulmonalis	13	5	50	" Minor			
(b) Tuberculosis of Glands	25	1	68	Other Operations			
(c) Lupus	—	—	—	Eye			
(d) Tabes Mesenterica	3	2	6	(a) Cataract			
(e) Tuberculous Disease of Bones	11	—	13	(b) Iridectomy			
				(c) Other Eye Operations			

Colonial Medical Reports.—No. 9.—Gold Coast.

MEDICAL REPORT FOR THE YEAR 1906

By Dr P J GARLAND

Acting Principal Medical Officer

THE general health of the European community was fairly good. Compared with 1905 there is an improvement.

The cases of death were, in officials: Blackwater fever, 2, hyperpyrexial fever, 1, hepatic abscess, 1, accidents, 2.

It will be seen that accidents were responsible for 2 deaths, and climatic diseases for 4. The case of hyperpyrexial fever was probably due to the effect of sun, the temperature rising to 107° on three occasions and the case being unaffected in any way by quinine.

The causes of invaliding amongst officials were malarial diseases, 14, blackwater, 7, rheumatism, 4, debility, 1, neuritis, 2, mental, 2, dysentery, 1, hepatic congestion, 1, hernia, 2, varicose veins, 1, alcoholism, 3, injury (self inflicted), 1.

The conditions militating against health are found in the prevalence of tropical diseases, malarial fevers, malarial debility, dysentery, blackwater fevers, and affections of the liver.

It is an interesting question whether the health of the Colony has improved of late years? I have no hesitation in saying the health has improved. Some years ago severe attacks of bilious remittent fever, yellow fever type, and hyperpyrexial fevers were common, but are now seldom met with. On the other hand, blackwater fever seems to increase its record slowly. Fifteen officials suffered from this disease throughout the year, and two cases terminated fatally. It may be interesting to non medical readers of this report to know that the gravity of this disease is greatly over estimated by residents on the West Coast. Careful nursing, and a little optimism on the patient's part, render this disease one of the most amenable we treat on the Coast.

Although a distinct improvement occurred in the health of the railway officials, this department still continued to show the worst health record, chiefly owing to the frequent illnesses of the second-class officials. The nature of the work undertaken is largely responsible for the ill health of these officials, but a great deal of minor ailments can be attributed to indifferent feeding and disregard to ordinary precautions of health. The servants of the second-class railway officials are the most filthy and thoroughly careless people I have ever observed, and I have no doubt but that many of the gastric and intestinal complaints suffered from are contracted from bad cooking, indifferent food, and neglect of filtration of water or cleanliness of utensils.

The general health of the mining community was moderately good.

The merchants and missionaries presented a good record of health.

Amongst non officials the chief causes for invaliding and deaths were blackwater fever and malarial fevers. These two diseases accounted for 14 deaths and 38 invalidings. Four non officials met their death in accidents.

NATIVES

Amongst the diseases of special interest were cancer, 4, sleeping sickness, 3, leprosy, 2, beriberi, 9.

The most remarkable occurrence in connection with the native health was the outbreak of cerebro spinal meningitis in the Northern territories, and it would appear that this disease took on a virulent epidemic type in places, in one case decimating a village.

Spontaneous cases of this disease have been observed from time to time. The existence of this disease was denied at Cape Coast in 1900, although diagnosed by a medical officer. In the year 1905 I diagnosed a case of this disease at Cape Coast, and satisfied myself by a *post-mortem* examination that it was correctly diagnosed. The recurrence of this disease will be closely watched and investigated. A peculiar fact, most likely coincidence, was that the outbreak was preceded by very gloomy, dark days, and most likely there was a marked change in the general meteorological conditions. At Gambaga the first quarter showed a high daily range in temperature and a low degree of humidity. A strong harmattan blew during this quarter.

None of the cases of cancer are recorded as having died during the year. It is almost impossible to persuade a native to remain under treatment for any time, and operative measures are scarcely ever consented to. There is great difficulty in obtaining a specimen *post-mortem*.

The cases of sleeping sickness coming under notice are in infinitesimal proportion to the actual cases which must occur. I am inclined to think this disease is not common in Ashanti, or in thickly forested country. It was alleged that a serious outbreak of this disease occurred at a village in the Northern Territories near Wa. No actual proof of this is forthcoming. There can be little doubt from the medical officer's report that this was an outbreak of epidemic of cerebro spinal fever.

RETURN OF DISEASES AND DEATHS IN 1906 AT THE FOLLOWING INSTITUTIONS —Government Hospitals at Accra, Cape Coast, Elmina, Axim, Kwitha, Kumasi, and Sekondi, Gold Coast

GENERAL DISEASES

	Admissions	Deaths	Total Cases Treated
Alcoholism	3	—	3
Anæmia	6	—	6
Anthrax	—	—	—
Beri beri	8	5	9
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken pox	40	—	40
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	24	3	24
Delirium Tremens	1	1	1
Dengue	—	—	—
Diabetes Mellitus	—	—	—
Diabetes Insipidus	—	—	—
Diphtheria	3	—	3
Dysentery	95	15	97
Enteric Fever	2	—	2
Erysipelas	2	—	2
Febricula	7	—	7
Filariasis	—	—	—
Gonorrhœa	22	—	23
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	6	—	6
Kala Azar	—	—	—
Leprosy	—	—	—
(a) Nodular	—	—	—
(b) Anæsthetic	2	—	2
(c) Mixed	—	—	—
Malarial Fever—	—	—	—
(a) Intermittent	—	—	—
Quotidian	28	—	28
Tertian	—	—	—
Quartan	—	—	—
Irregular	74	1	76
Type undiagnosed	—	—	—
(b) Remittent	269	3	273
(c) Pernicious	22	3	22
(d) Malarial Cachexia	1	—	1
Malta Fever	—	—	—
Measles	—	—	—
Mumps	—	—	—
New Growths—	—	—	—
Non malignant	8	1	10
Malignant	4	—	4
Old Age	—	—	—
Other Diseases	10	—	11
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	1	1	1
Rachitis	—	—	—
Rheumatic Fever	2	—	3
Rheumatism	99	1	101
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	3	1	3
Sleeping Sickness	2	3	3
Sloughing Phagedæna	—	—	—
Small pox	34	2	35
Syphilis	—	—	—
(a) Primary	2	—	2
(b) Secondary	9	2	9
(c) Tertiary	—	—	—
(d) Congenital	—	—	—
Tetanus	1	—	1
Trypanosoma Fever	—	—	—
Tubercle—	3	2	3
(a) Phthisis Pulmonalis	—	—	—
(b) Tuberculosis of Glands	—	—	—
(c) Lupus	—	—	—
(d) Tabes Mesenterica	—	—	—
(e) Tuberculous Disease of Bones	—	—	—

GENERAL DISEASES—continued

	Admissions	Deaths	Total Cases Treated
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	4	—	4
Yellow Fever	—	—	—

LOCAL DISEASES

	Admissions	Deaths	Total Cases Treated
Diseases of the—			
Cellular Tissue	75	—	79
Circulatory System—	—	—	—
(a) Valvular Disease of Heart	15	9	16
(b) Other Diseases	3	1	3
Digestive System—	141	10	142
(a) Diarrhœa	—	—	—
(b) Bill Diarrhœa	—	—	—
(c) Hepatitis	—	—	—
Congestion of the Liver	—	—	—
(d) Abscess of Liver	—	—	—
(e) Tropical Liver	—	—	—
(f) Jaundice, Catarrhal	—	—	—
(g) Cirrhosis of Liver	—	—	—
(h) Acute Yellow Atrophy	—	—	—
(i) Sprue	—	—	—
(j) Other Diseases	—	—	—
Ear	—	—	—
Eye	22	—	22
Generative System—	—	—	—
Male Organs	81	1	81
Female Organs	7	1	7
Lymphatic System	26	—	28
Mental Diseases	—	—	—
Nervous System	57	7	76
Nose	1	—	1
Organs of Locomotion	48	—	48
Respiratory System	127	19	129
Skin—	—	—	—
(a) Scabies	6	—	6
(b) Ringworm	—	—	—
(c) Trinea Imbricata	—	—	—
(d) Favus	—	—	—
(e) Eczema	—	—	—
(f) Other Diseases	206	—	213
Urinary System	20	2	20
Injuries, General, Local—	—	—	—
(a) Striasis (Heatstroke)	—	—	—
(b) Sunstroke (Heat Prostration)	—	—	—
(c) Other Injuries	—	—	—
Parasites—	4	—	4
Ascaris lumbricoides	—	—	—
Oxyuris vermicularis	—	—	—
Doelhmus duodenalis, or Aukjlo	—	—	—
stoma duodenale	—	—	—
Dracunculus medinensis (Guinea	—	—	—
worm)	61	—	63
Tape worm	—	—	—
Poisons—	—	—	—
Snake bites	—	—	—
Corrosive Acids	1	1	1
Metallic Poisons	3	—	3
Vegetable Alkaloids	2	1	2
Nature Unknown	—	—	—
Other Poisons	—	—	—
Surgical Operations—	—	—	—
Amputations, Major	3	2	3
Minor	19	—	20
Other Operations	—	—	—
Eye	—	—	—
(a) Cataract	—	—	—
(b) Irdeotomy	—	—	—
(c) Other Eye Operations	—	—	—

Colonial Medical Reports—No 9 —Gold Coast (continued)

The European commercial community here does not make contacts with the medical officers, and hence no medical aid is sought for many minor ailments that would otherwise increase and render more complete and accurate these returns.

At the native hospital there were treated 755 in-patients and 8,485 out-patients, 116 surgical operations were performed.

I am of opinion that the usefulness of the native hospital would be added to were a small ward built on to it which could be used for educated natives who dislike being waited with the ordinary class of native patients—the ward originally built for that purpose being now used as an operation room.

A large proportion of the work at the native hospital is provided by the native non commissioned officers and men of the Gold Coast Regiment.

The daily average strength of the native non commissioned officers and men in Kumasi has been 659.83.

The daily average number of sick native soldiers has been In-patients, 16.16, out-patients, 50.73.

During the year 6 deaths occurred among the native non commissioned officers and men, and 19 were discharged as being medically unfit. A bearer party has been formed and trained in stretcher drill and first aid.

The new European hospital on the Bantima Road is now approaching completion, and should be ready for occupation by the end of February. The building will contain three wards, a convalescent room, bath room, and store with outbuildings adjoining.

Vaccination has been a failure in Kumasi during 1906, owing to the fact that the lymph supplied from time to time has failed to produce cases of successful vaccination.

The rainfall in 1906 was 75.00 in as compared with 45.50 in in 1905.

The old bush house latrines have now been almost entirely replaced by permanent buildings of corrugated iron with stone floors. The work of emptying the pans from these latrines is becoming an increasingly arduous one, there are at the present time only 35 prisoners in the Kumasi gaol, and only a portion of these are available for sanitary work.

The rubbish and sweepings of the streets are collected in allotted areas in the town, and men are employed keeping the heaps in a state of ignition. The refuse from the lines is taken down the sanitary railway each morning and similarly treated.

The present native cattle compound at the Zongo during the wet season is very unwholesome and insanitary, the cattle standing knee deep in filth. A new compound with a stone floor, properly drained and fenced, is being built and will shortly be complete.

I regret it was thought necessary, for political reasons, to give the Ashanti chiefs and others permission to slaughter for sacrificial purposes in their own compounds. I cannot but think that this privilege will be greatly abused and will lead to the creation of a number of insanitary areas in the town. This is the more to be regretted as segregation is little practised in Kumasi, many of the European merchants

residing in close proximity to the native compounds.

A contagious diseases hospital has been constructed of swish on a suitable site some distance away on the Bantima side of the lines. A few suspected cases were isolated here on one occasion, but they turned out to be chicken-pox only.

A slight outbreak of dysentery occurred in April, which was traced to surface contamination of the European water supply. This was remedied and the well was better protected, provision made for overflow and increased ventilation, since then the water has been excellent from this and all the other wells. Several new wells were built during the year and have given satisfaction. As far as one can ascertain, the health of the natives has been fairly good. There have been no epidemics during the year.

THE NORTHERN TERRITORIES

Report by C V Le Fanni, Acting Senior Medical Officer

Reports from the various stations in the Northern Territories have for the most part been quite satisfactory. In February and March, however, an epidemic disorder was the cause of a large number of deaths. In Gambaga there were nine deaths amongst the soldiers alone during these months. In Wa and Kintampo, especially in the former, the same disease was observed, and there also resulted in many deaths. One death from the same cause was reported from Yeji. Dr Collier, in his report on Tizza, a town in Lobe Dagarti, stated that on his arrival there he found it practically deserted, and on making enquiries he elicited the fact that over 400 natives had fallen victims to an epidemic disorder, which in its clinical signs bore a strong resemblance to cerebro-spinal meningitis.

On my march from Gambaga to Yeji, during the month of February, I noted some undoubted cases of this disease in the towns I passed through. I have since received information from a reliable source that a similar epidemic had occurred in the French Territories on the Niger at the same time, and that it was there also diagnosed as epidemic cerebro spinal meningitis.

One case of sleeping sickness was observed in Gambaga, and confirmed as such by microscopic examination. It is particularly of interest for this reason, that the patient must have contracted the disease in this country. He is a native of a town west of Navarro. I have been informed that a number of guls from the same district came under the observation of the Medical Officers in Kumasi, suffering from the same disease. In this connection, I may remark that the tsetse fly has been met with in this neighbourhood.

Leprosy is reported as being very prevalent in Salaga and Yeji. It was very probably introduced by salt traders, who carried the disease with them from the villages and towns on the lower Volta. I observed numerous cases of this disease myself in Kpong.

Filarial disease, elephantiasis, is extremely common in Kanjarga and Fula-Fula. Many cases presented

themselves for surgical treatment in Navairo, and some have even come into Gambaga.

The sanitary condition of the various stations seems to be fairly satisfactory. The European quarters have been kept scrupulously clean and well cleared, and the measures adopted for the removal of rubbish and refuse proved adequate. However, the sites chosen unfortunately only too often leave much to be desired. They are frequently in close proximity to the native towns. Moreover, much stricter rules should be observed as regards debarring natives—boys, &c.—from living in the European settlements. Much illness would be avoided by giving to this matter the attention it deserves.

The supply of water is satisfactory in all stations with the exception of Salaga, as has been noted in previous reports.

Nearly all stations are supplied with gardens, which at least during the rainy season furnish a satisfactory amount of fresh vegetables. Gambaga is fortunate in having a garden which is capable of supplying all wants practically throughout the year. Tomatoes, French beans, garden eggs, radishes, cucumbers, lettuce, cabbage, onions, carrots and kohlrabi grow readily, and are of excellent quality. There is also now in Gambaga a large plantation of bananas and papaws, of these there has been an uninterrupted and more than abundant supply for the last four months.

The general health of the European officials unfortunately shows no improvement on that of the previous year. This is, in my opinion, the result of unnecessary exposure to malarial infection, and of needless and avoidable exertion in the heat of the day.

The number of officials actually in residence in the Northern Territories during the year 1906 was thirty-eight, and the average term of residence of each for the year 186 days. Seventeen other officials, from the Colony and Ashanti, and four non officials, were in the Territories for periods varying from a couple of days to three months.

The average daily number of native officials in the Northern Territories was 27.3. Their health for the year was excellent. None were invalided, and none

died. The more prevalent diseases, for which they were treated, were malarial fever and catarrhs. The average number of days on the sick list for each for the year was 5.24.

The general health of the 2nd Battalion Gold Coast Regiment for the year under consideration has not been so satisfactory. The death-rate, 26.8 per 1,000, was high, and the number on the sick list much increased, as compared with previous years. The invaliding rate was 2.3 per cent.

The record for the Government carriers has been fairly satisfactory.

The natives are availing themselves in increasing numbers of the opportunities for the treatment offered by the various hospitals. In Gambaga some have come for surgical treatment from villages three and four days distant. There were very many deaths in Gambaga and Wa as a result of the epidemic in the early months of the year.

The rainfall was very little under 12 in less than that of the preceding year. Although only average in the northern half of the Territories, it was extremely heavy in the southern part, where for days the roads were rendered quite impassable.

The harmattan was very marked during the first two months of the year, and was characterized by an especially thick haze. It is of interest to note that the epidemic of cerebro spinal meningitis occurred at a time when these northerly winds prevailed, and that it came to an abrupt close with their cessation.

As regards the influence of the meteorological conditions on the general health, there are one or two points of some interest. The healthiest period of the year was from beginning of February to the end of June, *i.e.*, the time when all pools, &c., were dry and rain water did not accumulate permanently. The unhealthiest months were from September to December. Catarrhal diseases, amongst the native races, were prevalent during the last two months of the year.

Guinea-worm occurred in greatest numbers during two periods, first from April to May, and second in August. The prevalence of guinea-worm is constant every year, and seems to correspond with the rainfall.

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MEDICAL REPORT FOR THE YEAR 1906

By Dr ERNEST HILL

In the year in question there were several outbreaks of infectious diseases, but no epidemics, excepting that of malarial fever.

VITAL STATISTICS—POPULATION

Europeans, including Mixed Races—The estimated population as to June 30, 1905, was 101,170. Between July 1, 1905, and June 30, 1906, the balance between entries and exits by sea and by rail shows a loss of 1,911 persons, as against 2,500 in the period April, 1904, to June 30, 1905. There has, therefore, been less emigration from Natal than in the previous months, and less than popularly supposed. In the period there were registered 3,110 births and 1,055 deaths, the balance of gain being 2,055. The population of Natal has been actually increased by 144, and is estimated to have been on June 30 101,314.

Indian Immigrants—The total on the Protector's books on June 30, 1906, was 98,049, as against 91,239 on June 30, 1905, an increase of close on 7,000 persons.

Natives—Estimated number, 930,000, as compared with 904,900 in 1904.

In two years since the census was taken the Europeans have increased by less than one-seventh per cent, whereas the natural increment, had there been neither immigration nor emigration, would have amounted to more than 4 per cent in the period, or about 2 per cent per annum.

The total Indian population, allowing for births and deaths in Indians who entered Natal under the ordinary laws, has risen from 101,000 in 1904 to about 115,000, an increase of close on 14 per cent in two years, whereas the natural balance of births over deaths increment would, at the present rate of deaths, not much exceed 1 per cent.

The natural increment of natives is estimated to be 1.6 per cent, assuming that the birth- and death-rates in Zululand are about the same as elsewhere in the Colony.

BIRTHS

Europeans—3,110 births were registered, being a rate of 30.68 per 1,000 living.

The birth-rate of England and Wales is recorded to be 1901, 28.5, 1902, 28.5, 1903, 28.4, 1904, 27.9. If, however, as was shown in the report of this department for 1905, the rate be calculated as per 1,000 married women of from 15 to 45 years, with allowances for different proportion of illegitimate births, the comparison is unfavourable to the Colony.

Although it is not unlikely that the birth-rate in towns is higher than in rural districts, the disparity is not so great as would appear from the registrations, because a number of births among parents living in the country are registered in the town offices. This is

evident from the fact that in Umgeni Division, which surrounds the borough of Maritzburg, only 5 births were registered, as against a natural expectation of 35, more or less, and in the Umlazi, around the borough of Durban, in a population of over 6,000, less than 100 births were registered.

Indian Immigrants—2,657 births were registered, equivalent to a rate of 27 per 1,000, as against a rate of 33 in the year 1905. This fall is doubtless, to no small extent, attributable to the influence of the malaria epidemic.

Natives—Not including Zululand, 24,229 births were registered, amounting to a rate of 34 per 1,000 of the population concerned, as against 34 and 31 per 1,000 in the two preceding years.

DEATHS

Europeans—Total deaths registered exceed the number in 1905 by 98.

Indian Immigrants—Total deaths registered exceed the number in 1905 by 726, but whereas the European population was practically stationary, the Indian immigrants increased by about 8 per cent, and it is convenient, for comparing the death rates, to take a basis of 100,000, on which the deaths are increased by 597. Sixty-four per cent of the increase is directly attributed to malarial fever, and nearly every one of the causes may be connected more or less with the same disease, in respect of its fatality.

INFANTILE MORTALITY

Europeans—Of children under 1 year of age, 5 more died in 1906 than in 1905, and the infantile mortality increased at the rate of 1.63 per 1,000 births, but whereas the mortality from other causes was less, that from diarrhoeal disease was greater by 5.48. There were registered 7 deaths less than last year from the other usual infectious diseases of infancy, but 17 more from diarrhoeal disease, which accounts for the whole of the increase of diarrhoea in the year. In respect of other fatal conditions, deaths attributed to malarial fever were more numerous, 21 as against 5 in 1905, and to premature birth 27 as against 16, while pneumonia, which brought about 21 deaths in 1905, was responsible for 7 only in 1906. Diarrhoea is much more common as a cause of death of infants in Maritzburg than anywhere in the Colony, and the period of heaviest incidence is in October and November.

The number of cases and deaths has steadily and rapidly diminished throughout the Colony in 1904 and 1905, but although the decrease was maintained in Maritzburg and Durban, in the rural districts it has again risen to double last year's figures, and to a slightly less extent in small towns. The Districts of Dundee and Dannhauser suffered severely, and cases

notified from there account for 60 per cent of the increase, while in Ixopo, Inanda, and Polela there was a markedly higher incidence, the remainder comprising sporadic cases in various parts of the Colony.

It is noteworthy that, with diminished incidence of the disease, the case mortality has risen year by year.

Mortality per cent of cases of enteric in the Colony was 1902, 9.91, 1903, 9.12, 1904, 11.24, 1905, 14.88, 1906, 15.10, while, with increase of cases in the current year, the mortality in minor towns has fallen from 25 in 1905 to 20 in 1906, and in the rural districts from 13.4 to 11.5.

The very high mortality amongst Indian immigrants in the past three years, and particularly the markedly diminished incidence of the disease in 1905 and 1906, since malarial fever became epidemic, indicate that the diseases are difficult of differentiation in alien races, and that only the very severe cases of enteric fever are recognized.

The polluted streams from which Maritzburg obtained its water supplies were abandoned in favour of a more satisfactory supply in 1905, but the reduction in number of cases preceded the change, and no alteration has been made in the character of the supply in Durban, which has for many years been efficiently filtered.

Enteric fever is very persistent in some of the Northern Districts where, and about where, coal-mining is carried on, and it is not difficult to appreciate the reason, in that there is considerable aggregation of persons of three races, and sanitary arrangements are far from perfect. Certain occurrences in connection with the Cambrian Colliery at Dannhauser, in 1906, give instructive illustration of the manner in which enteric fever is disseminated—

(1) In the spring and early summer the disease was severely epidemic among the small number of Euro-peans employed, and from the circumstances of the outbreak there was no room for doubt that the infection was conveyed in the water, which was highly polluted with washings from the coloured compound.

(2) A white man employed at the mine used each week end to repair to his home, which he maintained for his wife and two boys in Newcastle. He became ill there, the nature of his illness was not recognized until shortly before his death. The wife and one son were attacked a few days later, and the son died.

(3) Certain native convicts, working at the mine, were sent in to Newcastle gaol, and a few days later two were sick of enteric fever.

(4) A native girl consulted a European doctor, and was found to be suffering from enteric. On enquiry it was ascertained that a few weeks earlier her brother, who had been working at the mine, returned to the kraal, and was there very ill for a long time, one of his symptoms being diarrhoea.

(5) A native who had been working at the mine was found prostrate just outside Vryheid, he was suffering from enteric. Feeling unwell, he had left his work, and was endeavouring to get to his home.

Doubtless, if natives consulted European practitioners more often, abundant examples would become known of whole kraals being infected with enteric fever by a single visitor. These sick natives, in making their way laboriously home, may, *en route*, infect many water supplies, and it is probable that it is from pollu-

tion from such, and from mild and convalescent cases, that the constant excessive sporadic prevalence of enteric, in farms and other dwellings not on the coal mines, but in the neighbourhood, is maintained. Natives have a strong homing instinct when ill, and it is regrettable that many employers encourage sick natives to leave, rather than otherwise.

In the report of the Medical Officer of Health for Johannesburg, 1904 to 1906, allusion is made to a suggestion that canvas water bags, even though the water in them be boiled, may receive contamination from dust. At the Navigation Colliery 65 white men, of whom some have wives and children, are employed. Five men were attacked with enteric, and 2 died. They all lived in the single men's quarters on the same side, facing east. They all had been drinking water from a large canvas bag hung on the verandah. No other persons were attacked. The manager, Mr. Dewar, to whom I am indebted for the facts, considers that the cook, to whom the duty of boiling the water was committed, neglected to do so, the water used by others, however, was all derived from the same source.

The very heavy increase amongst Indians in the past two years may reasonably be attributed to the epidemic of malarial fever, which renders the subject more vulnerable to other infective agencies. The great disparity between the mortality in the two races is not surprising when consideration is given to the general carelessness of Indians of all classes, and the particularly insanitary conditions of the surroundings of the habitations of coolies, but it is somewhat remarkable that the year 1903, in which most cases of diarrhoea occurred in white races, was that of lowest incidence for the coloured, for which no explanation can be adduced.

The maximum occurs in early summer, after the first rains. At this season dust storms are common, and it is a matter of observation that flies in the household are much more troublesome than in the height of summer, when the rainfall is generally greater, at which time a sharp decline is observed in diarrhoea mortality.

The incidence was heaviest in Maritzburg, where the rate per 1,000 living reached 2.57, and lowest in rural districts at 0.84. In Maritzburg, in the past five years, the rate has not been below 1.90, and reached the height of 3.75 in 1903.

Malaria was removed from the list of notifiable diseases in the coast districts in the middle of the year, because the number of cases caused an appreciable expenditure in the payment of fees, for which no commensurate value is obtained in parts where the disease is known to be epidemic, especially seeing that it is impracticable to distinguish between recurrent attacks and new infections, it is, however, still retained on the list in other parts, where its occurrence is occasional. It is not, therefore, possible to trace the exact incidence of the disease month by month. The zenith of the epidemic was attained early in February, 1906, whereas in 1905 it was not reached until April.

The Medical Superintendent, Government Hospital, Durban, has kindly furnished me with a return of cases of malaria treated month by month in 1905 and 1906 respectively.

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(continued)

The Town Council of Durban, on the advice of the Medical Officer of Health, Dr Munson, had been, and is still, unsparing in efforts and unstinting in expenditure in carrying out measures for the limitation of the breeding of anophelina in the borough, but in the districts Government had been in no financial position to undertake the work of dealing effectively with the epidemic conditions, and consequently nothing had been done by this Department beyond tendering advice to landowners and employers, and encouraging the liberal use of quinine. There is, therefore, a useful control in the untouched environs of Durban, by which the effect of measures taken in the latter can be checked, but although the number of Europeans treated in the Durban Hospital indicated some reduction in prevalence of the disease, it was not possible to attribute this at all unreservedly to the effect of the measures during the year with which this report is concerned.

Since the beginning of 1907 malaria has again become epidemic, and by the onset of winter it will be possible to accurately assess the effect of the measures.

The epidemic incidence has now attained a magnitude which demands the most serious attention. The fact that the disease was epidemic some thirty years ago, and for close on thirty years Natal, south of the Tugela, had been relatively free until 1905, indicates that the country is outside the natural endemic area. There is, therefore, reason to suppose that past history will be repeated, and that, as has happened elsewhere for the most part, when an epidemic wave has surged up over a district or area commonly comparatively immune, it will again recede, but there is no valid ground for anticipating a sudden recession in the immediate future. If the incidence next year is to equal that in the summer and autumn 1906/7, some project for mitigation of ravages in the districts must be undertaken. A choice lies between adoption of measures directed against the propagation of mosquitoes and of methods for popularizing the general systematic use of quinine. The former is far more scientific as attacking the matter at its source, and in limited areas is certainly the more sure and satisfactory, but over a wide extent of country with small aggregations of population, and scattered habitations throughout, it is very difficult to ensure completeness even apart from expense. The latter is certainly likely to cost much less, though it would be very difficult, if not impossible, to induce coloured persons to employ the drug at times when not actually ill.

Dr Potts, District Health Officer, Lower Tugela, has, in his report for the year, made an interesting observation as to the incidence of malarial fever on different members of the household. It is probable that the smoky atmosphere of the Indian hut deters mosquitoes from entering to any great extent. Dr Potts also alludes to the effect of anti mosquito measures—

“Very considerable improvement in the village of Stanger has taken place since the breeding pools have been treated with paraffin, and this summer not only

has the number of mosquitoes been enormously diminished, but malarial fever has been practically non-existent.

“One would have thought, with the excessive rainfall, the malarial mosquito has had better opportunities for breeding.

“The records are not reliable, but the number of natives who died, more especially in the low lying districts, from malarial fever and its complications is, I am convinced, very considerable.

“Amongst the Indians employed on the various estates I have been able to gather the fact that the men employed in the fields in the early morning are most prone to the disease, the women who remain behind to cook their food, less so, and the children, who remain indoors until later, least of all.

“With regard to the destruction of mosquitoes, and the results since the Health Department granted the supply of paraffin in September to deal with these pests, much has been done. The pools on the commonage have been regularly treated, and all bottles and other receptacles in vicinity of the hotels, &c, have been buried, the number of mosquitoes has enormously diminished, and malarial fever appears to be kept thoroughly in check.

“The Bush has also been cleared to a very great extent, but more is necessary in this respect.

“Upon Darnall Estate treatment of a similar nature has been adopted, with the result that what was one of the most fatal localities last summer appears now to be practically free.

“That the banana plant affords at certain stages a breeding place for the mosquito I am convinced, but that the Anopheles actually utilize this plant for breeding purposes I am not, up to the present time, certain.

“During the year two cases of what appeared to be what is generally known as blackwater fever have come under my observation, and both were successfully treated by hypodermic injection of quinine.”

The Town Council of Maritzburg has not yet recognized the desirability of making phthisis pulmonalis notifiable, nor the undesirability of being an exception in such a matter, consequently the notifications in Europeans represent about 85 per cent of the population. From the commencement in 1904, 219 cases have been notified in Europeans, and 428 in Indians, while the deaths in 1905 and 1906 amount to 133 and 428 respectively. The average duration of life in tuberculosis appears to be about three years, from which it is evident that in Natal either the disease progresses much more rapidly to a fatal termination, or many sufferers do not seek medical advice, or else the law does not receive adequate recognition.

At the end of 1904 a form of death certificate was drawn up, containing spaces, among other things, in which the duration of residence of deceased in the Colony and in the place where death occurred should be stated. This was issued to medical practitioners with a request that it might be adopted for general use, and it is very gratifying to note that generous response has been given to this request, and in most instances no small trouble taken to fill in the details. As a result it is possible to state the length of residence of a majority of persons deceased of phthisis.

RETURN OF DEATHS AMONGST EUROPEANS IN 1906 IN THE Colony of Natal

Diseases	All Ages	Diseases	All Ages
Measles	3	Senile Gangrene	1
Epidemic Influenza	6	Embolism, Thrombosis	3
Whooping Cough	8	Other Diseases, Heart and Vessels—	
Diphtheria	11	Heart Disease	47
Enteric Fever	37	Heart Failure	21
Diarrhoea, Dysentery	35	Other Conditions	3
Epidemic Enteritis	101	Laryngitis	1
Tetanus	1	Croup	6
Syphilis	3	Other Diseases, Larynx and Trachea—	
Gonorrhoea	1	Acute Bronchitis	15
Erysipelas	1	Chronic Bronchitis	10
Puerperal Fever	6	Lobar Pneumonia	8
Pyæmia	6	Lobular Pneumonia	11
Other Allied Diseases—		Pneumonia	38
Ulcer of Tonsil	2	Emphysema, Asthma	6
Carbuncle	1	Pleurisy	1
Cellulitis	1	Ulcer of Stomach and Duodenum	4
Malarial Fever	81	Other Diseases of Stomach	2
Rheumatic Fever	2	Enteritis	3
Rheumatism of Heart	1	Appendicitis	10
Tuberculosis of Brain	2	Obstruction of Intestine	7
Tuberculosis of Larynx	1	Cirrhosis of Liver	6
Phthisis	80	Other Diseases of Liver	11
Abdominal Tuberculosis	1	Peritonitis	5
General Tuberculosis	5	Other Diseases, Digestive System—	
Other Infective Diseases—		Chronic Diarrhoea	1
Hyperpyrexia	1	Other Conditions	2
Leprosy	1	Diseases of the Lymphatic System and Glands—	
Hydatid Diseases—		Acute Nephritis	7
Worms	4	Bright's Disease	13
Scurvy	1	Diseases of Bladder and Prostate	5
Acute Alcoholism	3	Other Diseases, Urinary System—	
Chronic Alcoholism	6	Not specified	1
Osteoarthritis	1	Ruptured Urethra	1
Cancer	45	Diseases of Uterus and Appendages	2
Diabetes Mellitus	8	Abortion, Miscarriage	1
Anæmia	2	Puerperal Convulsions	1
Premature Birth	27	Placenta Prævia, Flooding	2
Injury at Birth	2	Other Diseases, Pregnancy and Childbirth—	
Debility at Birth	13	Ectopic Gestation	1
Congenital Defects—		Other Conditions	2
Heart Disease	1	Other Diseases, Osseous System—	
Other Defects	6	Osteomyelitis	2
Atrophy, Debility, Marasmus	25	Ulcer, Bedsores	1
Dentition	12	Accidents and Negligence—	
Old Age, Senile Decay	46	In Mines and Quarries	3
Convulsions	14	In Vehicular Traffic	2
Meningitis	4	On Railways	2
Encephalitis	1	By Weapons and Implements	1
Apoplexy	27	Burns and Scalds	5
Softening of Brain	1	Poisons, Poisonous Vapours	5
Hemiplegia	11	Surgical Narcosis	2
General Paralysis of Insane	2	Drowning	9
Other forms of Insanity	5	Suffocation	2
Epilepsy	2	Falls not specified	1
Locomotor Ataxia	1	Weather Agencies	4
Paraplegia	3	Otherwise, not stated	13
Other forms Brain Diseases—		Homicide	11
Tetanus Neonatorum	1	Suicides—	
Serous Effusion	2	Poison	3
Laudy's Paralysis	1	Hanging and Strangulation	1
Neuritis	1	Shooting	7
Otitis	1	Cut or Stab	1
Pericarditis	2	Precipitation from Elevated Places	1
Endocarditis	17	Other and unspecified methods	4
Angina Pectoris	1	Execution	1
Aneurism	4	Ill defined and unspecified causes	11

In 1905 particulars were given in 33 to 53, and in 1906 in 64 to 80

The increase in number of deaths in 1906 (80), as against 1905 (53), is found principally in age periods, 20 to 25 (7), 35 to 45 (11), and over 45 (6), and whereas the proportion to the total of persons of less than one year's incidence is slightly increased, that of persons of six years' and upwards has risen from 30 to 51 per cent of the total. It is true that about 36 per cent of the deaths in the past two years were of people who have entered the Colony within three years of death, but, for all that, a good proportion must have become affected in the Colony. Of those who have died within a few weeks of arrival the majority have ended their days in one of the Government hospitals in far from prosperous circumstances. There can be no hesitation in classing such persons as undesirable immigrants, and every obstacle should be placed in the way of shipping companies receiving them for passage to South Africa. There must also be a considerable number of persons arriving in whom the disease is well advanced, and it is desirable to exercise some supervision of such.

It would be difficult to justify the application of any special regulations or restrictions on immigrants with means of support, which are not applied to persons already in the country, who are no less a source of danger. The whole matter, however, together with the question of preventing consumptives being placed in the same cabin with healthy persons, has been thoroughly considered and reported on by a Conference of Principal Medical Officers of Health of the various Colonies, and is now receiving attention of Government.

Information is not presently available in the Department in respect of the duration of residence of Indian immigrants deceased of phthisis, from which any table can be prepared. These immigrants are medically examined before departure from India, and on arrival at Durban, despite which a significant number die, within a few months of arrival, of tuberculosis of the lungs. This is particularly noticeable on certain coal fields, and is also commented on by Dr Potts, District Health Officer, Lower Tugela, in respect of persons allotted to sugar planters.

When Indian coolies were first introduced into Natal, the mortality from tuberculosis of the lungs was not severe, it showed, however, a progressive, and more lately a rapid, increase to a maximum incidence of 3.30 per 1,000 living in 1904, since when it has undergone a sharp fall to 1.98. The records, however, do not admit of a definite statement as to whether the fall is wholly real or partly apparent only, because the influence of malarial fever cannot be eliminated. A person suffering from advanced tuberculosis frequently becomes infected with malaria, and the latter actually brings about death, but it may well be that a number of such persons would, in any case, have succumbed to the more chronic complaint in the course of the year.

Nevertheless, it would be improper to deny credit altogether to the measures adopted for the limitation of phthisis. The matter first received definite attention in 1902, at which time the rate was excessive among persons employed at certain of the coal mines,

but although high, it was not very seriously so else where. New regulations were passed, having reference principally to housing accommodation, at that date very inferior, and quite unsuited to the cold winter climate of high altitudes, such as 4,000 ft. in this latitude. The housing has been greatly improved, and on many mines is now as good as could be desired. The phthisis death rate at first diminished considerably, but it is at the present much higher than it should be at nearly all the mines. The comparative mortality from this disease among coal-miners in England and Wales is slightly below the mean for all occupations, but on indentured Indian coolies in Natal the occupation has certainly a deleterious effect. A difference in the incidence on the employees of different mines, employing considerable numbers of coolies, attracted the attention of the Protector, and formed subject of conjoint investigation with the Health Officer for the Colony. No connection could be traced with the quality of housing, which is at all passably good, for at a mine where the housing was not the most satisfactory the death toll of phthisis was relatively light, but at another mine, where some of the accommodation is the best in the Colony, the disease persisted in attacking people occupying some of the newest barracks, despite removal of observed cases to hospital, thorough disinfection of all presumably infected houses, and periodic disinfection of all rooms, from which it appeared that infection must be a "droplet" infection. No constant connection could be traced in the position or aspect of the barracks, nor in any other circumstance of the like character, which might be thought to influence the incidence, but it appeared that the mines least affected were really protecting themselves by a custom of weeding out all coolies of inferior physique or stamina, who appeared to be weaklings, and transferring such to other employers, such as farmers. This has a two-fold influence, it saves the infected coolie from an early death by securing him an occupation and surroundings which tend to rehabilitate him by increasing his power of resistance, and it reduces the number of new cases on the company's property by limiting the foci of potential infection in the compound. The matter is receiving attention in all quarters concerned, and the managers of the mines are displaying every disposition to comply with any recommendations for mitigating the incidence.

It was not until the end of 1903 that the incidence of phthisis on some sugar estate employees demanded serious attention. In 1904 instructions were issued by the Protector for periodic disinfection of all huts occupied by known phthisical subjects, and for thorough disinfection and temporary evacuation of all huts occupied by persons removed to hospital for treatment. An endeavour was also made to segregate in separate quarters coolies returned from hospital treatment, but this was found impossible. Some portion of the improvement must certainly be attributed to these measures adopted, and to the improvement in housing conditions which has been effected in the past three years.

The barracks provided by employers of coolie labour have been the subject of much well-deserved adverse comment, but a good deal of improvement has taken

place in the last three years, partly as an entirely voluntary act by the employer, partly under inducement of the Protector and the Department of Public Health, and more largely on account of exercise by the latter of its legal powers. In the year 1905 some 900 rooms, and in 1906 over 600, have been condemned as unfit for human habitation, some unconditionally, but the majority subject to certain improvements being immediately carried out. There has been no real opposition on the part of employers, although it cannot be expected that they should accept cheerfully the increased burden of expenditure.

Good grass huts are as comfortable and satisfactory a habitation as any, provided that the site is suitable and the floor raised, but they rapidly get into disrepair, and are costly in the long run, and there is always some danger of fire. Many employers have now provided rooms of brick, with door and glazed window, and some with a chimney flue.

Ankylostomiasis.—It was noted in the Report of this Department for the year 1905 that the worm *Ankylostomum duodenale* had been identified as a cause of illness and contributory cause of death in a few Indians at Tongaat. This cannot, however, be termed a "discovery," for having regard to the fact that it is of fairly common occurrence in parts of India, it would be expected that some coolies would harbour it on arrival, while their careless habits would make extension of infection inevitable.

The reason for ankylostomiasis—the condition resulting from the presence of the worm in the duodenum—not being previously recognized is, that no search had been made for the ova. I had in earlier years drawn attention to the probability, but want of facilities prevented any investigation from being made.

There is no ground for regarding it as of recent importation, but the records of deaths and disease in Indian immigrants contain many entries of an ill-defined nature, such as generally result from this infection.

The knowledge, however, of its identification at Tongaat gave a stimulus and roused some interest in other parts, in consequence of which portions of faeces were submitted to examination for ova of ankylostomum, with the result that it was shown to have a fairly general distribution among Indians in the sugar-planting districts.

One hundred and thirty-three specimens were examined in the laboratory at the Port of Durban, in 25 of which ova were identified.

In the latter part of the year the Indian Immigration Trust Board appointed an extra medical officer for a few weeks for the Tongaat circle, for the particular purpose of dealing with ankylostomiasis. As a result, in this circle during the year 1906, in 102 persons evidences of infection were found, amounting to 4 per cent of the Indian labourers resident there, ranging in different parts from 2 to 7.

These results only show the number of persons suffering from a fairly considerable infection, some cases in which the worms were relatively sparse have probably escaped detection, although examination was made, and other persons showing no well marked evidences of anaemia were not further examined.

The proportion of the residents found to be infected with worms is not large, considered in relation to reports from other parts of the world, but it is sufficiently high to be worthy of very serious consideration, for it is undoubtedly likely to increase rather than diminish unless steps are taken for its control.

So far attention has been directed chiefly to Indians working mostly under indenture, but Dr L. G. Haydon, who was seconded to act as Resident Medical Officer to the Temporary Convict Station at Jacobs at its opening for that purpose, has taken advantage of the opportunity to study conditions affecting natives, and among other useful observations he records identification of ankylostomum in ten persons, being 3.9 per 1,000 of total number of prisoners who have entered the station.

The general circumstances of life and the habits of the Bantu under natural conditions are not such as would favour any extension of infection, kraals being, when possible, erected on sloping ground, and defecation being effected at a distance from the habitation, and not generally in one place, so that walking in fouled soil is avoided. The sites adopted for the mud huts of Makolwa, or Christianized natives, are less favourable. Whether or no their habits of cleanliness lessen with acquisition of trappings of civilization is not known to me, but the aggregation of communities contracts the available space, and makes it more likely that soil around habitations would be fouled.

It is interesting to observe the facts which Dr Haydon has gathered about these natives. He notes that four were engaged in washing clothes on a river bank, and that six had been living in close proximity to Indians. The soil on river banks, being constantly moist, is a most favourable medium for the incubation of the ova.

Up to the present no information is available in respect of coal mines, for want of material for examination. Indians in those districts, however, do not appear to suffer much from anaemia, speaking generally, although from time to time on some of the mines the health of some is unsatisfactory, without being attributed to any definite disease.

Natives, so soon as they feel their health failing, wish to go home, and are not discouraged by employers, consequently they are seldom submitted to medical treatment, and very rarely die at their place of employment.

The worms may be present in numbers from two or three dozen up to several hundreds, and the effect varies with the number. The general conditions produced are anaemia, with dyspepsia and general weakness, but not much wasting. To quote Manson: "The first step towards diagnosis is to suspect. An anaemia in the Tropics or in some one from the Tropics, in the absence of the usual and more familiar causes of that condition, should suggest a microscopical examination of the faeces for ova of the ankylostomum." When dealing with coloured labourers, one might with propriety go further, and say that, whenever a man exhibits indications of ill health which are not adequately accounted for by recognized defined illness, he should be suspected of ankylostomiasis, and, if suspected, steps should be forthwith taken to examine the excreta.

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(continued)

I am informed that in a certain part of the coast belt numerous cases of ankylostomiasis have been reported. On enquiry it appears that in only one instance was the faecal excrement examined for ova, and that the rest of the cases were diagnosed on "general indications," and no steps were even taken to verify diagnosis by inspection of the stools for worms after treatment for their destruction. It is perfectly obvious that a diagnosis formed in such a manner is no diagnosis at all, that, worse than useless, it is positively pernicious, because where some of the cases of such disease which are recorded are so named on no real evidence, the statistics of the whole are made unreliable and utterly misleading.

The disease is not often directly fatal, but it contributes heavily to fatality of other diseases, and produces much disablement, and interferes greatly with labour.

The knowledge established by Loos, that infection occurs through the skin, has an important bearing on prevention. Seeing that the ova escape in the faeces, it is obviously of the first importance to prevent soil pollution by promiscuous defaecation about the neighbourhood of barracks, but this may be supplemented by protection of the feet and legs from entry by the embryo by covering with tar and sand or sawdust, as has been done in Trinidad with great success as a remedy for "coolie itch," which is now established to be a symptom of ankylostomiasis. Feet and legs were dipped in a bucket of Barbados tar, and the men walked across a layer of sand or sawdust.

The essential in prevention is the use of latrines. There are difficulties in inducing coolies to use them, and difficulties in keeping them clean, but, unless the use is enforced, no headway can be made against the ankylostomum. Dr Park Ross, when in temporary service of the Indian Immigration Trust Board, devised an excellent framework and screen arrangement for latrines, which rendered fouling of sides of trench quite difficult. It is desirable that the use of latrines with similar fittings be made obligatory on coast plantations. This will do much to protect the indentured and other labourers, although it will not affect the scattered communities of small cultivators. These, however, are relatively few in number, and no effective means of reaching them are available.

Measles was reported as prevalent in Harding, in Indians at Tinley Manor, and Indians and natives in Alexandra County, in which latter it was associated with meningitis. As to the latter, the District Health Officer reports—

"The Ellesmere native school was closed on account of this disease following measles.

"There was an epidemic of measles on several of the estates, commencing with Beneva, of which a report was sent. I believe this epidemic caused a good deal of mortality, but as the cases are not notifiable I did not get the number of cases or deaths."

Scarlet Fever—Fifty cases were notified, but no deaths registered, 356 cases in Europeans have been notified in the past five years, and three deaths registered, from which it is evident that the disease in Natal is, at present, of very mild character, which

accentuates the difficulty of tracing the origin of cases. A few cases are notified in Indians, and it occasionally comes to light in natives, to whom the origin of two cases in white children was traced in Alfred Division.

Diphtheria and Membranous Croup—Ninety cases were notified, being over 60 per cent above the average of the previous four years. In the five years 1902-6, 336 cases were notified, and 75 deaths registered in Europeans, giving a case mortality of 22 per cent, 215 cases occurred in towns, and 121 in country districts, 44 deaths in the former, and 31 in the latter. Thus, whereas the incidence on the towns is higher, the fatality is less. The case mortality in the Colony in 1906 was only 12 per cent.

There was a number of mild cases in Greytown and Umvoti District, as to which the District Health Officer, Dr Wright, reports—

"*Diphtheria*—There has been a good number of cases of this disease, far above the usual, but the type has been mild, only one case having proved fatal, that of a little child 18 months old.

"The first occurred in Greytown in April, and ended after a few days in recovery. In June two fresh cases occurred, and there was then no further outbreak until September 9, when a child, aged 2½, was attacked with the disease, and from this house it spread to three other houses in the township in rapid succession. In one case the infection was traced to milk supplied to a family from an infected house, and in another instance personal contact with an infected person was clearly the cause of the disease spreading. The first case was reported as existing 12 miles out in the country at Vermaak's Kraal, here a little girl, aged 2½, took the disease and died quickly, her sister, aged 17, who assisted to nurse her, also took the disease, but recovered. A third case occurred in a young man who was said to have been exposed to the risk of contagion at Vermaak's Kraal, and who fell sick at his own house some days after. This man was treated with antitoxin and recovered, so far as his throat symptoms were concerned, but he was still ill and eventually he was found to be suffering from enteric fever. The doctor who attended him is positive that the man had an attack of diphtheria coincident with enteric. His sister, who nursed him with enteric, caught the disease and died. The young man attributed his illness to bad water which he drank a short time before he was taken ill. In another instance diphtheria spread from child to mother, the child being attacked first, and then the mother. This same child spread the disease to another lady who came into personal contact with her. With the exception above noted, the disease did not attack more than one person in the same house. The cases were most of them treated with antitoxin, and were mostly of a very mild type, and answered immediately to the treatment. I made a personal inspection of the premises in all the cases which arose in Greytown, but in only one instance did I find anything likely to cause the disease. This was where a lad of 8 was playing in a garden where a large manure heap had been recently disturbed and deposited in many smaller heaps all over the garden. There was a foul smell all over the place, which was noticed also by the boy when playing. As the lad fell ill within a few days of this,

I think there can be little doubt as to the cause. The houses were all thoroughly disinfected before the patients were allowed to go out and mix with others."

Leprosy—In addition to native cases, which are dealt with separately, ten cases were reported among Indians, of whom eight were returned to India, one could not subsequently be traced, and the other case, which was notified on December 29 only, will be returned in due course. A case in a Griqua girl was also reported from Harding, and arrangements were made under which she was received into the asylum at Pretoria. In the location at Matikulu are only pure natives, and it would have proved costly to provide suitable accommodation for an isolated Griqua.

Small-pox occurred in natives only.

Chigoe, or Tigger Flea—The insect appears to be fairly common in parts of the coast districts, but does not inflict much damage, because, as observed by Dr Potts, District Health Officer, Lower Tugela, the people understand how to deal with the condition.

Plague—There has been no case during the year. The last case of plague occurred in Natal in October, 1905, since when no infected rats have been discovered, 3,449 rats were examined in the Corporation Laboratory, Durban, and 533 by the Port Health Officer, all with negative results.

Vaccination—No routine vaccination was carried out during the year, but a few natives residing in the immediate neighbourhood of kraals in which small-pox had appeared were vaccinated.

In the first part of the year no financial provision existed, Parliament having granted no funds for the financial year 1905-6, for the year 1906-7 £4,000 was voted, but the estimates were passed later than usual, and consequently no arrangements could be effected for regular vaccination of natives, but 7,000 were vaccinated by Mr H. S. Power, a lay vaccinator employed for the purpose.

The work will be vigorously pressed forward so soon as the rainy season is past, and will be done by district surgeons as usual.

In the last session of Parliament an amended Vaccination Act was passed, and is now in force, under which all persons are under obligation to have children vaccinated within six months of birth, and again within six months of attaining the age of 12 years. A clause was inserted for the relief of the conscientious objector, whereby the greatest possible facility is given to this section. A few months experience will enable the numerical strength of the sect to be gauged.

HEALTH OF NATIVE POPULATION

There are no data from which any sound estimate of the vital condition of the natives can be formed. Deaths are registered in all parts except Zululand, and it may be that the fact of death is fairly well registered, although the registered deaths could not be accepted as a really accurate index. Even, however, were it ideally accurate, it would be very incomplete in its utility, because the ages, as given, are uncertain, and the causes of death, being recorded under such heading as the magistrate's clerk thinks most suited to the vague description of the "official witness," are far too unreliable to afford any suggestion at all as to what may be the particular forms of

disease which are causing fluctuations in the total deaths from year to year. One must, therefore, fall back on what can only be called casual observations of district health officers, which, though not without considerable value, cannot be reduced to statistical form, nor made of general application.

It will be convenient to take diseases of importance in serial order.

Measles—Reported as having been prevalent in children in Alfred, Bergville, Dundee, Poloka, Kiantz-kop, Entonjaneni, Nkandhla, and Alexandria, in which latter county, in several instances, meningitis occurred as a sequela.

Small-pox—There were 25 cases only reported: 7 in Alfred, 3 in Estcourt, and 15 in Ixopo, of which 1 only (in Estcourt) proved fatal.

Enteritis and dysentery were reported as prevalent in parts of Umgeni, Dannhauser, Liou's River, and Entonjaneni.

Pneumonia was extensively prevalent in Dannhauser in the latter part of the year.

Enteric Fever—Only 28 cases were notified during the year. This, however, only represents a fraction of those which have probably occurred, because, as above stated, unless numbers were attacked at one kraal, or the disease was very destructive, nothing would be known of it. Natives, as is well known, will, when ill, always make for home, a course in which they are generally encouraged by employers, and if infected with enteric fever, secondary cases will certainly occur.

Malarial fever has unquestionably been the disease of most importance in 1906. Previously to 1905 natives south of the Umfolosi River were very seldom affected, certainly not to an extent that caused them any apprehension, but in the past two years malarial fever has made its mark further south than Durban. Fortunately the situation in which natives place their habitations, when they can choose, is inimical to a high malarial incidence, and thus it happens that, severely as it has made itself felt, it has involved limited areas only, and has consequently not made any marked impression on the death-rate in general. Reports indicate an epidemic prevalence along the course of the larger rivers, as the Tugela, running through Kiantz-kop, Nkandhla, Mapumulo, Lower Tugela, and Umlalazi, though no mention is made of it in Eshowe, which is bounded by the Tugela. In some parts of this river valley, not only have families been decimated, but in instances have been almost exterminated. Some amount of quinine was supplied for use, but the native is not likely to continue its employment persistently during returning health, which is necessary for success. The Umvoti Valley, in Lower Tugela Division, and those of Umgeni and Umlaas, in Camperdown, have been severely attacked. These rivers run mostly in deep, hot valleys. There has been less than usual in Hlabisa and Lower Umfolosi, and in Ingwavuma till the end of the year, and the cases reported in Alexandria County were nearly all infected in Durban. If the recent epidemic conditions continue, some definite plan for inducing the natives to take quinine, and giving them facilities for obtaining it, should be set on foot.

Syphilis—Reported as a prevalent disease in Alfred,

Umvoti, Klip River, Alexandria, Camperdown, Estcourt, Polela, Mapumulo, Indwedwe, Lower Umfolosi, Upper Umkomanzi, and Ndwandwe, while less than usual has been seen in Lower Tugela, Dundee, and New Hanover. Congenital syphilis reported as common at Himeville. The District Health Officer, Lower Umfolosi, quotes a case in which a man arrived from further south, and infected six women before leaving again, still uncured, to carry on business as a spreader of disease.

The reports above quoted are more or less casual observations, on the other hand, Dr Haydon, in 2,500 prisoners, only observed evidences of the disease in twelve. Most of the prisoners came from the Mapumulo District, and had worked in Durban. A higher incidence might have been expected.

There is no doubt that this disease is prevalent, and beyond question it is of increasing importance, but its distribution is very unequal in Natal, as in other parts of South Africa, it may affect a high percentage of the people in one district, and be almost unknown in others.

It is certainly desirable that more precise information be obtained as to the prevalence of syphilis, the knowledge which the natives have of it, and particularly the extent to which it spreads by other than ordinary sexual channels, and for this direct and purposeful investigation is necessary. In the meantime, however, a definite effort should be made to assist natives by giving them information about the disease, which was, I think, done to some extent a year or two ago, by paying rewards to headmen and responsible persons for informing on sufferers, and bringing them for treatment, and by control of prostitution in towns. The matter was considered and reported on at a recent Conference of Medical Officers of the various South African Colonies, and several recommendations made.

Tuberculosis—This disease is reported prevalent in Umvoti, Klip River, Lower Tugela, Alexandria, Camperdown, Estcourt, Polela, Umlazi, Mapumulo, Upper Umkomanzi, Amatongaland, Impendhle, Indwedwe, and Umlalazi, special reference in the three latter being made to enlargements of lymphatic glands.

Dr Haydon reports as to the native convicts (2,500) at Jacobs —

"The proportion of natives who are the subjects of tubercular disease is, from a public health point of view, somewhat alarming. Moreover, I have no doubt that the figures mentioned in Table "D" (i.e., 58), or a percentage of 2.25, do not represent the total affected, because it happens that a prisoner in the initial stages of the disease does not complain till some catarrhal attack brings on a painful cough."

Of the 58 persons, 35 were suffering from tuberculosis of the lungs, or phthisis, 23 from other manifestations of tuberculosis. Dr Haydon remarks of the former "I have made brief notes of the history of these patients, and find that in many cases they give a history of continuous work in Durban (19), or Maritzburg (4), or state that other members of their kins are likewise affected (10)."

These records kept by Dr Haydon accord with the general opinion of District Health Officers —

(1) That there is a high proportion of cases of tubercular disease other than phthisis.

(2) That although the disease manifests itself principally in men working in towns and at labour centres, yet it is not confined to such, but is also spreading to persons who do not leave the country, such as women and children.

From returns obtained through the courtesy of the Chief Commissioner of Police, it is found that 204 native prisoners died in prison in 1906, 29 deaths were attributed to phthisis or tuberculosis of the lungs, 4 to other forms of tuberculosis, and 8 to tuberculosis simply. The rate is 8.4 per 1,000 average daily strength for all forms of tuberculosis, and 6.0 for tuberculosis of the lungs. Comparison¹ may be made with the rate in the gaols in India in 1904-5 of 3.1 per 1,000, and with the rate per 1,000 male Indians over 15 years of age living in Natal, which is also 3.1 per 1,000 living. Twenty per cent of the deaths of natives in Natal gaols were caused by tuberculosis in some form, which is a little higher than the proportion in males over 15 years in England and Wales, 1904.

From this it is evident that tuberculosis was extensively prevalent in natives undergoing imprisonment in 1906, but as the majority of the persons were rebels, and thus came from a limited area of the Colony only, it would not be quite secure to infer that the same rate prevails throughout.

The Conference of the Medical Officers of the South African Colonies concluded that in purely native areas the prevalence varies, but that in many the disease appears to be on the increase. The Conference was also convinced that the most important measure is a great improvement in housing conditions and general sanitation in towns and labour centres, particularly the reduction of overcrowding, but that good would result from dissemination of information about the disease.

There is no room for doubt that the increase of tuberculosis is a most serious thing for the native population, and that something should be done early. This disease and syphilis are not less "loathsome" than leprosy, are far wider spread, and are much more readily contracted, £1,500 a year is spent on the segregation of a few lepers, but nothing at all is expended to reduce or limit the incidence of syphilis and tuberculosis.

Leprosy—The disease in Natal natives is very mild for the most part compared with conditions in the East, and is not nearly so destructive. Periodic scares arise as to the alarming increases of leprosy, but enquiry elicits no evidence bearing out the allegations. The number of cases is increasing, but not rapidly, nor to an alarming extent. It is generally considered by those with best opportunities to judge in South Africa, that leprosy will not be eradicated except by general and complete segregation, but this does not alter the fact that it is of far less importance, whether to natives or to whites, than tuberculosis and syphilis.

The condition of the natives at the location is satisfactory, and the number of complaints made by inmates is surprisingly small. The management and control by moral suasion only—for there are no physical obstacles to escape—is remarkably creditable.

¹ Report on Sanitary Measures in India, 1904-5

to Mr G Gielink, the Superintendent, who succeeds in inducing them not to lead an idle life, but to do such work as each is able in agricultural pursuits, whereby a considerable saving in cost of maintenance is effected

Scurvy has been very little in evidence, except in gaols, and there chiefly in rebels who had suffered much privation previous to their incarceration. The incidence of scurvy in gaols has always been unsatisfactory, but a new dietary scale just adopted should do much to ameliorate conditions

Intestinal Parasites—Sole information on this point is derivable from Dr Haydon's report, in which he writes—

"The enormous proportion of natives proved to be affected by intestinal parasites (21.8 per cent) is without doubt very far short of the mark. I estimate that at least 50 per cent are affected either by tape worms, round worms, or whip-worms—often by all three. I had some cases in which all these three were occupants of the intestine in addition to the hook-worm, but naturally the signs of ankylostomiasis eclipsed the symptoms due to the others."

The latter was found in ten instances, and Dr Haydon suspects it to be present in others, but had not at the time been able to verify his suspicions. This is the first occasion on which the worm *Ankylostomum duodenale* has been encountered in natives in Natal. Their habits in "kraal life" are inimical to spread, but it may become of importance where they are concentrated

Sigwebedhla—This appears to be the native title for a condition found only on low levels near the sea in the north of Zululand. The symptoms appear to be an irritation of the lower end of the intestine, producing inflammation, and subsequently giving rise to prolapse of the bowel, which then becomes gangrenous. The condition is one that causes much suffering, which must, inevitably, continue through after life, even if recovery ensues from the immediate condition, there is practically nothing known about the origin or cause of the condition, and although its area of prevalence is limited to a few hundred square miles in the summer season, it would be well worth the small expenditure necessary for a detailed enquiry

In connection with this disease, the following letter from the District Health Officer, Ingwavuma, is of especial interest—

"I have been making enquiries on the subject, but up to the present have been unable to do much, as I am still suffering from an attack of malaria, contracted in the low veldt last month. You state that little is known about the disease, and that it is essentially a low veldt complaint. This is not so, as I have seen more cases on the high veldt than in the low veldt. I have at present a case under my observation of a native who has never been in the low veldt. From information gathered from one or two natives I feel certain that the disease is consequent on severe bilious attacks, and the peculiar kind of low bilious fever that one so often meets with in the mountains of Zululand. I am given to understand that it is extremely prevalent in the Nongoma district. In the treatment of it the natives use an enema of a weed called 'Hloma Hloma,' which removes the bile. Then they scour the sores

with wood ash, and finally dust the sores over with a root called 'Sibana,' which they grind into a powder. For medicine internally, they invariably give quinine in small doses."

SANITATION OF VILLAGES

There is a certain amount of complaint made from time to time as to sanitary condition of villages, now one, now another, in respect of the absence of water supply or its pollution, and alleged nuisance from want of proper refuse removal. The Village Water Supply Act of 1897, and the Amendment Act of 1902, enabled any village community to call upon Government to make provision for proper water supply, and for any matter connected with drainage or sanitation generally, at the expense of a rate to be levied on the village. Although many villages have taken advantage of the Water Supply Act, not one has taken any steps to set in motion the amending Act, which provides for sanitary removals, &c. It is unfortunate that no compulsory clause was introduced, because the fact of there being such an Act precludes any expenditure on the measures in question being borne on the general revenue, and the continuance of sanitary evils is perpetuated

WATER SUPPLIES

Public water supplies were sufficient during the year. Those of Newcastle and Greytown came under suspicion, by reason of a considerable prevalence of gastro-enteritis, which, however, was prevalent elsewhere too, in the early part of the summer. It is improbable that the condition of the water produced the illness, but both waters were found to be considerably polluted with excremental matter. There was no evidence to show the origin, which may probably have been derived from cattle droppings chiefly, though cotton fibres were reported to be present in the Greytown water.

The Newcastle water is derived from the Incandu River, which is always open to pollution, but the Town Council has provided suitable filter beds, which appear to be capably managed. These filters, however, failed to arrest the *Bacilli coli* and *B. enteritidis sporogenes* and streptococci, by reason of, apparently, insufficiency of area for the amount consumed, as a result of which the filters were worked with too great a head, and no time was given to a clean filter to ripen. The Town Council has decided to construct further beds, and has the construction already in hand.

The Greytown water is derived from a very sparsely inhabited water shed, and on the few previous occasions on which it has been examined has been remarkably free from evidences of animal contamination, although always yielding a rather high organic ammonia figure of vegetable origin. There are generally cattle at grass on the water shed, which would well account for the organisms found, though not for the cotton fibres. Seeing that a large part of the water shed is now the property of the Local Board, there should be no difficulty in obtaining security, but just above the intake is a native footway at the bottom of a deep valley, away from observation, and it is desirable that this should be deviated to cross the stream a little lower and below the intake.

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Pollution of Streams—Complaints arise from time to time of offensive nuisances and serious destruction of fish, resulting from the intentional or accidental (but nearly always the former) discharge into rivers of liquid refuse from sugar mills, distilleries, and from wool washings. Although in certain instances steps have been taken by the Department of Public Health to prevent this, by requiring the owners of such places to construct adequate watertight tanks, and to instal pumps to carry the waste to a distance, it is a very difficult matter to prevent occasional pollutions. The refuse has a corroding effect on metal, and from this and other causes the pumping plant at times breaks down, and with the occurrence of heavy rains the earth, of which it was formerly the custom to construct the banks of reservoirs for reception of refuse, is washed away, or the heavy flow of rain-water carries into the stream refuse which, in dry weather, would disappear partly by evaporation and partly by soakage. During the year 1906 complaint was made as to the Isipingo and Umlaas Rivers, the conditions in respect of the former are improved, and the latter is receiving attention.

In November the Health Officer for the Colony proceeded to Cape Town to attend two Inter-Colonial Conferences on the subject of increasing facilities for research into diseases of man and animals, and on various matters connected with public health coming under direct control of Governments respectively. The former occupied two days, and the deliberations of the latter extended over twelve days. Reports of both Conferences are in the hands of Government.

Report by H E Fernandez, Port Health Officer

During the past year the health of this port has been endangered by the existence of serious infectious disease in foreign ports, with which we are in constant communication. At the beginning of the year Mauritius was infected with bubonic plague, although not to such a serious extent as it had been for some time previously, the weekly average of cases being only 4 or 5. Calcutta was infected with bubonic plague, and also with small-pox. The case of small-pox which occurred on the s.s. *Umzinto* was almost certainly infected at this port. Bombay was infected with plague. Karachi was infected with plague. Port Elizabeth was notifying each week a few cases of plague in rats, but there were no human cases.

During the months of January and February Cape Town had a few cases of small-pox, which persisted through the whole year, and East London also notified 1 case of small-pox. The ports of Portuguese East Africa were all issuing clean bills of health, so it was concluded that the epidemic of plague which had visited this district towards the close of 1905 had entirely disappeared. The Consul at Lourenço Marques cabled that quarantine regulations in the province of Mozambique had been removed as from December 21, 1905. Plague was said to have been epidemic in Madeira in December, 1905, if not earlier, but no official notification has been made in accordance with the Paris Convention of 1903, and the existence of this disease was denied, in a letter to the *British Medical Journal*, by one of the English medical men

practising at Funchal. During the first week in March, ships arriving at this port from Mauritius brought clean bills of health, the first time for several years. About the same time, West Australia notified a few cases of plague (Perth, 5, Fremantle, 6, Geraldton, 7), and there have been a few isolated cases at most of the Australian ports during the year, but nowhere has it been of any serious importance.

In July, plague again appeared in Mauritius, and has existed there in varying degrees of severity until the end of the year. A few plague infected rats were found at East London between May and September, and a few were also notified from King William's Town. There were also a few cases of rat-plague at Port Elizabeth in the month of August. Bills of health from Bombay, Calcutta, Madras, and Karachi showed the existence of plague, cholera, or small-pox infection up to the close of the year.

One thousand and twenty-eight rats were trapped in the Point area, 974 of these were sent by the Port Captain's Department, for which a bonus of 3d per head has been paid, amounting to £12 3s 6d. Fifty-four were received from other sources, for which no bonus has been paid. None of these rats gave evidence of plague infection.

During the past year there have been no cases of either human or rat plague in this port.

The wharves, sheds, latrines, &c, have been visited daily, and the regular and unsparing use of liquid disinfectants by the Wharfmaster's Department has secured a very satisfactory condition of cleanliness.

There have been very few cases of gastro intestinal disorders of any importance in ships lying at our wharves, and the condition of affairs in this connection has much improved during the past two years.

All Government buildings have been visited periodically, and I should again desire to place on record my appreciation of the assistance given to me in this connection by Inspector Kendal, of the Borough Sanitary Staff.

SALISBURY ISLAND QUARANTINE STATION

All the Government buildings and property have been kept in repair as far as possible, and the weeds kept down in all paths and open spaces, but the houses are suffering very much from the ravages of time and weather, and a considerable amount of expenditure will shortly be compulsory to maintain them in a habitable condition. A full report on this subject has been furnished for the information of Government in papers P H O 481/05, forwarded on December 17 last.

An application was made to me for permission to retail light refreshments on Salisbury Island during the Christmas holidays, and tenders were called for this concession. The successful tenderer has erected a temporary building, but the inclemency of the weather limited the number of visitors to the Island to such an extent that the undertaking was most unprofitable. This concession has been renewed until Easter at a small monthly rental, with the understanding that at that time Government shall be furnished with full information in regard to the business done, in order that we may arrive at a fair valuation for any future tenancy.

Small-pox—The ss *Umzinto* arrived at this port on February 8, with 501 Indian immigrants from Calcutta. The Surgeon Superintendent reported that on January 27 one of the Lascar crew was taken ill, and on the 29th the case was isolated in a boat, in view of possible developments. On February 3 he died of small-pox. One attendant and one immediate contact were also isolated, as many of the crew as possible were vaccinated with the small supply of lymph available, and the boat and crew's quarters were thoroughly disinfected. On arrival here it was found that 101 of the immigrants and 44 of the crew were insufficiently, or not at all, protected by vaccination, so all of these were vaccinated at once. The immigrants were then removed to the Bluff Depot, and kept there until February 20, and the two contacts isolated on the hulk *Madeleine*, in the bay. The ship was thoroughly disinfected again with 1 in 500 cyllin, and given pratique. The ship's crew were inspected daily during the vessel's stay in port, but there was no further extension of the disease, either among the crew or the immigrants who had been landed at the Bluff.

In connection with this case representations were made as to the importance of arranging that Indian immigrants were vaccinated in depot at a sufficient interval of time before embarkation to permit of its being fully recognized whether the vaccination had been successful or not, so that, if necessary, failures could be re-vaccinated. As an alternative it was suggested that the Surgeon Superintendent should in all cases be provided with sufficient fresh lymph for all possible emergencies. It may here be well to mention that systematic examination has been made for the last three or four months of the year to ascertain the condition of all shiploads of indentured Indian immigrants in regard to vaccination. This enquiry first disclosed an unsatisfactory state of affairs, but the representations made to the Immigration Trust Board by the Health Officer for the Colony appear to have produced considerable improvement, as the last two or three ships have been much more efficiently protected than those first examined.

On February 17, the Deutsche Ost-Afrika Linie ss *Sultan* arrived at this port from Bombay. She reported having landed two cases of small pox at Tanga on January 29. These cases had been efficiently isolated on board immediately after their discovery, and careful disinfection performed. All who did not show small pox marks, or recent vaccination marks, had been vaccinated at once by the ship's surgeon. As these cases had been landed eighteen days before arrival at this port and there was no sign of any sickness, pratique was given, and passengers were allowed to proceed to their destinations after all their baggage had been sterilized.

The ss *General*, belonging to the same line, arrived here on February 28, and reported having landed two cases of small pox at Zanzibar on February 10. Forty-one passengers, who did not appear to be sufficiently protected, were vaccinated, and as there was no sign of any sickness after an interval of eighteen days from the landing of the cases, the passengers were allowed to proceed to their destinations after their baggage had been sterilized.

A similar incident was reported by the ss *Reichstag*,

of the same line, which arrived at this port on March 9. The case had been landed at Tanga on February 22. All who appeared to be insufficiently protected were vaccinated, and all the passengers' baggage sterilized.

On March 21, one case of small pox and one contact attendant were removed from the ss *Pongola* to a hulk in the bay, and attended by me until fit to be discharged.

On April 1, one coloured passenger suffering from small-pox was removed from the ss *Mirzapur*, with one contact attendant, to a hulk in the bay, and was there attended by me until he was fit to be discharged.

Two English sailors suffering from small pox were removed from the ss *Greta Holme* on June 4 and taken to Salisbury Island Hospital for treatment. The last case was discharged on June 26.

CHINESE IMMIGRATION

During the year 1906 six vessels have arrived at this port bringing Chinese immigrants for the Chamber of Mines Labour Importation Agency, and on January 5, 1907, the last consignment arrived under the original Ordinance. The statistics in regard to this shipment are, under these circumstances, included with the others, although they should properly appear in my report for 1907.

These seven vessels have brought to this port 12,883 Chinese coolies, and have reported on arrival 63 deaths during their voyages.

For purposes of comparison it is interesting to note here the death rate on our own Indian immigration ships, and also on three ships which have called at this port conveying indentured Indians from India to the West Indies.

	No of ships	No of coolies	No of deaths	Death rate per mille
Natal Indian Immigration Department	23	10,805	32	3.15
Chamber of Mines Labour Import Agency	7	12,883	63	4.8
West Indian Immigration Department	3	2,444	21	8.6

When we take into consideration the fact that the voyage from China takes about twice as long as the voyage from India, it will be understood that the mortality figure of the Chinese ships shows that the transportation arrangements on the Chamber of Mines steamers are of the highest degree of excellence.

It must be further noted in this connection, that no less than 39 of these 63 deaths were due to relapsing fever, which must have been contracted in depot, and an examination of the causes of the other deaths shows that 9 from pneumonia, 4 from enteritis, and 1 from diarrhoea are the only ones which can in any way be considered as preventable.

The food and cooking have been excellent, the cleanliness of the compounds, living rooms and their surroundings, beyond reproach, and the septic tank has given the best results. Every request for extra staff in the hospital, medical comforts, drugs and appliances, has at once been cheerfully granted, and it

would be difficult to suggest any means of improvement in the conduct of this part of the Agency's undertaking

*Report by L. G. Haydon, Resident Medical Officer,
Jacob's Convict Station*

Pneumonia and Bronchitis—It will be seen that these two complaints have furnished the majority of hospital patients. From a considerable number of microscopical examinations of sputum, and of lung exudate after death, I find that the organism constantly present in large numbers is a minute bipolar bacillus, resembling the influenza bacillus of Pfeiffer.

The clinical symptoms also have constantly resembled influenza, rather than the classical European pneumonia.

In several cases in which the patient was already consumptive a severe and obstinate pleurisy has resulted from the pneumonia attack, and in two cases which died signs of recent general tuberculosis of the lung were observed.

Speaking generally, the pneumonia attack was almost always of the nature of a broncho pneumonia or a lobular pneumonia.

Undoubtedly these complaints are highly infectious, and extra precautions were taken in the way of washing out the cells daily with a solution of cyllin, so that all sputum might be disinfected before drying. In spite of this, many of the staff were affected with temporary acute bronchitis with severe depression, which in a few cases resulted in pneumonia, and in the case of one European convict guard resulted in death. The latter, however, had been consumptive for some years.

Phthisis and Tubercular Diseases—The proportion of natives who are the subjects of tubercular disease is, from a public health point of view, somewhat alarming. Moreover, I have no doubt that the percentage of 5.25 does not represent the total number affected, because it happens that a prisoner in the initial stages of the disease does not complain till some catarrhal attack brings on a painful cough.

I have made brief notes of the history of these patients, and find that in many cases they give a history of continuous work in Durban (19) or Maritzburg (4), or state that other members of their kraal are likewise affected (10). I also gather that the sleeping accommodation of natives working in towns is, in many cases, conducive to the origin and spread of this disease.

Ankylostomiasis (Hook-worm Disease)—I believe this to be the first occasion on which this complaint has been found to be prevalent among Natal natives.

The number mentioned is, I am convinced, far short of the actual number of cases really existing among the prisoners. Early cases escape detection, and it is only when a man has shown increasing anaemia and debility that the case comes under notice. Several suspicious cases of "burning feet" remain unproved, but the next few weeks will probably clear up the diagnosis.

These ten cases have been readily cured with the exception of one, who does not tolerate large doses of thymol.

After treatment the patient rapidly regains flesh and condition.

Brief notes of the history of these cases show that three were probably infected on the right bank of the Umgeni, near the road bridge, where they were employed washing clothes. One was probably infected washing clothes on the banks of the Umsindusi, above Maritzburg. The remainder have worked and lived in proximity to Indian habitations, chiefly in the north coast districts.

Scurvy—The scurvy toll has been heavy. The first three months of prison life, during which the diet scale contained no meat ration, have, I think, accounted for this. Hard labour long-sentenced prisoners should certainly be on first class diet from the commencement, if health is to be preserved, and a due amount of work obtained from them. The general condition and health of the prisoners here have markedly improved since the inauguration of a new diet scale on December 1.

Malaria—Incidence has been unexpectedly small, and in all cases has been of benign tertian variety.

Dysentery and Enteritis—In the early stages of the epidemic of pneumonia and bronchitis in the spring, a large number of patients were admitted suffering from temporary enteritis as well as pneumonia. It took the form of severe intermittent griping pains in the abdomen, with profuse diarrhoea, often accompanied by a little blood. These symptoms subsided, as a rule, in three or four days. In some cases, however, the enteritis was the more prominent symptom, and the accompanying bronchitis was of minor importance. The idea was thus thrust upon one that possibly the exciting cause of both complaints was the same. No research was, however, made in the way of systematic examination of excreta of enteritis patients.

Very occasionally the enteritis persisted, and finally developed into true dysentery, as shown by *post-mortem* observation.

Quite a number of the European staff were temporarily affected.

Intestinal Parasites—The enormous proportion of the natives proved to be affected by such, 21.8 per cent, is without doubt very far short of the mark. I estimate that at least 50 per cent are affected either by tape-worms, round-worms, or whip-worms, often by all these. I had some cases in which all these three were occupants of the intestine in addition to the hook worm, but naturally the signs of ankylostomiasis eclipsed the symptoms due to the others.

On treatment (concerning which the natives show remarkable intelligence) the general condition improves in a marked degree, and the amount of food craved for is appreciably less. Where large numbers of natives are fed, as in prisons and by employers of labour, it would be an excellent and economical practice to first dose for intestinal parasites. I believe these parasites tend in no small degree to the onset of enteritis and other complaints, besides producing restlessness and discontent, and in my opinion it is difficult to exaggerate the importance of the removal of these parasites in dealing with natives.

Cerebro-spinal Meningitis—It will be seen that two cases have occurred. Clinical signs demand such a

diagnosis, but no confirmatory evidence was forthcoming as to the organism present, because no spinal fluid was drawn off. No spread of the disease occurred, and possibly this diagnosis is doubtful.

Remarks on Sanitation—The compound is admirably adapted for keeping clean, and latrine and bathing accommodation leaves nothing to be desired. Some

overcrowding has existed. Animal parasites, such as lice, are rapidly disappearing, all blankets being periodically steeped in disinfectants.

Fully 10 gallons of water per man per day are now being used for flushing purposes, and the sewage effluent from the septic tank and bed is improving. There has always been a non putrefying effluent.

Colonial Medical Reports.—No. 11.—Sierra Leone.

MEDICAL REPORT FOR THE YEAR 1905

By W F PROUT,

Principal Medical Officer

PUBLIC HEALTH

THE population for the whole Colony (not including the Protectorate) is 76,384, on the basis of the increase which took place during the previous ten years. The total number of deaths registered was 2,156, a death rate of 28.2. The number of births registered was 1,399, a birth rate of 18.3.

It is again necessary to point out that the deaths exceed the births, but it is extremely probable that a number of deaths and births in the outlying districts escape registration.

Freetown—The statistics are more accurate, especially as regards deaths, and may be relied upon. A new Ordinance, which will ensure a more accurate registration of births, has now been prepared, and will be placed before the Legislative Council at an early date.

Death rate—The total number of deaths registered in 1905 was 1,071. From these, two deaths which took place on board vessels in harbour have to be deducted, giving a total of 1,069, a death-rate of 29.6 on an estimated population of 36,071.

The death-rates for the previous four years are as follows—1901, 28.9, 1902, 24.9, 1903, 23.9, 1904, 26.7. 1905 therefore shows a very marked increase over the previous years, being only approached by 1901.

Apart from the deaths under the age of five years, the principal causes of death are seen to be debility, respiratory diseases, and diseases of the alimentary system. The deaths from respiratory diseases predominate in the early part of the year. "Debility," which is a very vague term, accounts for a large number in the early part of the year, and the deaths from this cause are distributed at the two ends of the age scale, a large number occurring within a few hours of birth, and again in people over 65. Of course, in many cases the ages are to be regarded as approximate only, but the number of deaths among elderly people during 1905 has been unusually large. There can be little doubt that the prevalence of diseases of the digestive system is due to the general in-

sanitary conditions in which the mass of the people live.

The usual loss of life which has taken place in the earlier years of existence is again shown out of a total of 1,069, 319, or 36.5 of the whole. The infantile mortality—that is, deaths under 1 year—is 296. With a total of 642 births registered, we obtain an infantile death rate of 461 per 1,000 births, a very considerable increase over the previous year. The infantile death rate for the previous four years is as follows—1901, 575.8, 1902, 466.9, 1903, 471.16, 1904, 398.67. The improvement which took place last year has not been maintained.

A large proportion occur within a few days of birth, and are evidently connected with the process of labour. It is essential that the midwives of this city should be brought under some control, and should be trained and licensed. Ignorance on the part of mothers as to the proper feeding and upbringing of children is also another important factor in this high child mortality.

European Death and Sick Rates—Eight European deaths were registered in Freetown, the causes of death being as follows—Apoplexy, 1, pneumonia, 1, rheumatic fever, 1, malarial fever, 3, blackwater fever, 1, chloroform poisoning, 1. Of these, 3 were landed from steamers, leaving a total of 5 deaths among the European population of this town. Three of them were due to malarial fever.

The total number of deaths from climatic causes among the European residents of Freetown has been very small during the past three years, in spite of the fact to which I have called attention in previous reports, that the European population has considerably increased. As the Europeans are constantly changing it is not possible to estimate exactly the total number, but taking the European population as ascertained at last census, namely 270, with 5 deaths, we have a death-rate of 18.5 per 1,000, the lowest which has been recorded for many years. If the two deaths from rheumatic fever and chloroform are excluded, we obtain a death-rate of 11.1 from climatic causes. This points to a very considerable improvement in the health of the European population of Freetown.

Colonial Medical Reports—No. 12—Windward Islands,
St. Vincent (*continued*)*Report by Cyprian R. Pike, Medical Officer,
No. 4 District*

The population of the district is between 10,000 and 11,000, as far as I can ascertain. During the year under review there have been 330 births (males 165, females 165) and 126 deaths (males 74, females 52). These figures give a birth-rate of 31.42 per 1,000 and a death-rate of 12 per 1,000. The successful vaccinations show a slight falling off this year, being only 282 as compared with 299 in 1904-5, and 315 in 1905-6.

The health of the district during the past year has been very satisfactory. There have been no cases of azymotic disease, and the 8 malaria cases treated were all direct from Trinidad.

*Report by Dunbar Hughes, Medical Officer,
No. 5 District*

This district consists of the islands of Union,

Canouan, and Mayreau and other islets, but the three mentioned are those inhabited. The islands are only visited quarterly, a few hours being spent at each island, and owing to the paucity of these visits only a very meagre report is possible.

It is impossible to arrive at the vital statistics with any degree of accuracy, the records are kept by laymen, and I presume the causes of death are surmised by them from the symptoms most prominent before death—certainly during the past three years I have received no single application for a death certificate, nor have I issued one. These records, therefore, possess no scientific value and can only serve as a record of the number of deaths, even these, however, have not been furnished me for my report.

The sanitation of these islands is primitive and rudimentary, they, however, appear to be singularly free from malarial and other fevers, nor have I seen a single case of yaws or filaria there. The only sanitary work undertaken last year was the putting of a few pounds of permanganate of potash in the pond at Mayreau, which had become malodorous.

Colonial Medical Reports.—No. 13.—Trinidad and Tobago.

MEDICAL REPORT FOR THE YEAR 1906-7

By JAS A DE WOLF,

Surgeon General

GOVERNMENT MEDICAL OFFICERS

THE usual return respecting medical officers, the nature of their employment, and the amount of leave taken by them during the year are contained in Appendix A.

The following changes occurred in the medical staff. Dr E. A. G. Doyle took charge of the district of South Naparima on April 1. Dr P. E. H. Giuseppe, subsidized medical officer of Erin-Guapo, was appointed District Medical Officer, Cedros, succeeding Dr Hewlett, deceased, after having acted in that capacity since September 1, 1904. Dr C. W. Howatson, who had acted as District Medical Officer, Bocas, since May 15, 1905, was confirmed in that appointment. Dr A. D. Thomson was appointed a supernumerary surgeon at the Colonial Hospital on September 25, 1906. Dr A. A. Robinson, medical officer No. 4 District, Tobago, was transferred to the San Fernando Hospital as assistant surgeon on December 1, 1906.

SURGEON-GENERAL'S OFFICE

Mr C. N. Libert, third clerk, was appointed Warden of Montserrat on September 1, and was replaced by Mr George Ulrich from the Audit Office.

MEDICAL ATTENDANCE ON THE POOR

A return showing the number of paupers and poor persons treated at the Health Offices, Port-of-Spain, and at the out-stations, will be found in Appendix B.

Owing to the enforcement of the Regulation requiring holders of poverty certificates to pay a fee of one shilling each time prescribed for (instead of sixpence, as had been the practice for a number of years), and also to a more rigid restriction in the issue of medical comforts, the attendance at the Health Offices in Port-of-Spain from the month of July showed a falling off of some 50 per cent, and the expenditure for medical comforts was correspondingly reduced.

PUBLIC HEALTH

A—Remarks on the Prevalence of Certain Diseases

Extracts from the reports of district medical officers are appended.

There is no doubt that the meteorological conditions during the past year have been peculiarly favourable to the prevalence of disease.

Malarial fevers have been unusually prevalent, and have shown a tendency in many instances to take on a severe type. One case of hæmoglobinuric fever occurred at Arica in March.

Bowel complaints, *z. e.*, diarrhoea and dysentery, were unusually prevalent

Rather severe epidemics of the latter disease occurred at Chaguanas towards the end of the year, at Guaraacra in May, June and July, at Indian Walk from April to July, and at Rock River in July and August

Influenza has been rife throughout the year, and generally of a more severe type than usual, and in many instances with serious complications

Varicella—Cases of this disease were reported in Port-of-Spain, Arima, and Indian Walk, but nothing approaching an epidemic occurred

Yellow Fever—On January 30 a case of yellow fever occurred, which proved fatal on the fifth day. It was of the severe hæmorrhagic type

The patient had arrived in the Colony a month previously from Barbados, where he had been residing for a year. It was found impossible to trace the infection. All precautions were taken to prevent the spread of the disease, and no further case occurred until March 3, when Captain C. J. Dyke, aide-de camp to His Excellency the Governor, developed the disease. He was removed to the Colonial Hospital, where he died on March 7

The residence of the first case is situated at a distance of a mile or more from Government House, and no connection could be traced between the two cases

The next case occurred on March 14 at a house situated at about $\frac{1}{4}$ mile to the east and windward of the house where the first case occurred. This case also proved fatal on the 18th

The fourth case occurred on the 18th. The patient's residence was about $\frac{1}{4}$ mile from Government House, and to the windward. This patient recovered

The next case, which proved fatal, occurred at the Queen's Park Hotel, which is situated at a considerable distance from the nearest of the localities where the disease had previously showed itself

All these cases occurred in persons who were only a short time in the Colony, and had been in the West Indies less than two years. All were of a severe type, and four of the five cases proved fatal

On the occurrence of the first case steps were at once taken for screening and isolating the patient, and for fumigating the house and the adjoining premises, and the residents in the immediate neighbourhood were kept under daily observation

These measures were carried out generally with respect to subsequent cases

The staff of assistant sanitary inspectors was augmented for the more effectual inspecting and cleansing of yards throughout the town

A proposal from the Acting Inspector General of Constabulary for enlisting the services of the police in carrying out these duties was gladly accepted, and their co-operation proved of great assistance in the work of sanitation

It was evident from the beginning of the epidemic that the infection was spread over a wide area in Port-of-Spain. No case, however, occurred near the water front or in the lower half of the town

It is to be regretted that it has not been found possible to arrive at any satisfactory conclusion with

regard to the origin of the epidemic. Yellow fever is not endemic in Trinidad. It is remarkable that epidemics of the disease (although a difference of opinion obtained amongst medical men as to its nature) appear to have occurred at intervals of about twelve to thirteen years, viz. in 1869, 1881-2, 1893-4, and in 1907

Trinidad is peculiarly open to the importation of infectious disease from the neighbouring mainland of Venezuela, presenting a long coastline in close proximity, and there being no obligation on the part of the Venezuelan authorities to notify the existence of such infectious disease

(Up to the end of June there have been twenty-four cases notified, with eleven deaths. Later cases were generally of a milder type. The fact that not more than one case occurred in any house would afford ground for believing that the preventive measures adopted were effective)

Ankylostomiasis continues to prevail extensively, chiefly among the Indian population, and is a serious cause of disability amongst the labourers on the estates. I have taken steps to carry out as far as practicable the measures specified in my last Annual Report for controlling and, if possible, stamping out this disease

Circulars were issued to all district medical officers directing (1) The systematic examination of all indentured immigrants, and the treating of all found infected, (2) the forwarding of a monthly return of cases, and the Protector of Immigrants was requested to impress upon the managers of estates the importance of giving every assistance in the carrying out of these measures, including the providing of the necessary appliances for the examination of feces. I regret to say that the estate authorities generally have not responded cordially to this appeal, and consequently little has yet been done to carry out the scheme indicated

Faws—Detailed returns of the numbers treated in Trinidad during the year and of the number remaining at the end of the year are appended

I regret that I am not able to present more satisfactory results with regard to the measures taken to stamp out this disease. Certain districts, notably in the case of Indian Walk, show a satisfactory decrease in the number of cases treated, in others, however, more especially in Manzanilla and Toco, the numbers have been considerably larger. With regard to the latter, this result has been no doubt partly due to changes of district medical officers, in the case of Manzanilla, to the fact that, being a new and rapidly growing district, there has been a considerable influx of population from other districts. In both districts also the searching has been more efficient than formerly

Further experience has fully confirmed the fact that the only satisfactory method of dealing with this disease is to treat all patients in hospital, the dispensary system having shown very serious defects which it is not possible to remedy. The hospital accommodation, however, is not sufficient to allow of this method being fully carried out

That the total number of cases under treatment shows an increase over the previous year is no doubt

RETURN OF DISEASES AND DEATHS IN 1906 7 AT THE FOLLOWING INSTITUTIONS —
Colonial Hospital, San Fernando Hospital, and District and Yaws Hospitals

GENERAL DISEASES

	Admis- sions	Deaths	Total Cases Treated
Alcoholism	23	—	24
Anæmia	485	68	513
Anthrax	—	—	—
Beri beri	—	—	—
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken pox	21	—	21
Cholera	—	—	—
Choleric Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	263	63	269
Delirium Tremens	—	—	—
Deugue	—	—	—
Diabetes Mellitus	11	1	13
Diabetes Insuperidus	—	—	—
Diphtheria	6	2	6
Dysentery	—	—	—
Enteric Fever	132	50	110
Erysipelas	27	51	28
Febriola	—	—	—
Filariaasis	—	—	—
Gonorrhœa	243	—	262
Gout	1	—	1
Hydrophobia	—	—	—
Influenza	17	3	17
Kala Azar	—	—	—
Leprosy	—	—	—
(a) Nodular	7	1	7
(b) Anæsthetic	17	2	17
(c) Mixed	6	2	6
Malarial Fever—	—	—	—
(a) Intermittent	—	—	—
Quotidian	—	—	—
Tertian	1119	13	1152
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	4	2	4
(b) Remittent	37	12	37
(c) Pernicious	79	52	79
(d) Malarial Cachexia	40	3	43
Malta Fever	—	—	—
Measles	9	—	9
Mumps	1	—	1
New Growths—	—	—	—
Non malignant	53	—	54
Malignant	97	25	46
Old Age	117	33	126
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	3	2	3
Rachitis	—	—	—
Rheumatic Fever	—	—	—
Rheumatism	206	1	207
Rheumatoid Arthritis	2	—	5
Scarlet Fever	—	—	—
Scurvy	1	—	1
Septicæmia	9	12	9
Sleeping Sickness	—	—	—
Sloughing Phagedæna	1	1	1
Small pox	—	—	—
Syphilis	—	—	—
(a) Primary	34	—	34
(b) Secondary	77	1	84
(c) Tertiary	86	17	99
(d) Congenital	15	8	15
Tetanus	22	16	22
Trypanosoma Fever	—	—	—
Tubercle—	60	22	72
(a) Phthisis Pulmonalis	—	—	—
(b) Tuberculosis of Glands	—	—	—
(c) Lupus	—	—	—
(d) Tabes Mesenterica	—	—	—
(e) Tuberculous Disease of Bones	—	—	—

GENERAL DISEASES—continued

	Admis- sions	Deaths	Total Cases Treated
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	1000	—	1254
Yellow Fever	3	1	3

LOCAL DISEASES

Diseases of the—			
Cellular Tissue	290	1	300
Circulatory System—	—	—	—
(a) Valvular Disease of Heart	206	51	219
(b) Other Diseases	54	14	60
Digestive System—	—	—	—
(a) Diarrhœa	544	141	556
(b) Bill Diarrhœa	—	—	—
(c) Hepatitis	10	2	12
Congestion of the Liver	6	—	6
(d) Abscess of Liver	12	7	12
(e) Tropical Liver	—	—	—
(f) Jaundice, Catarrhal	13	2	14
(g) Cirrhosis of Liver	52	19	52
(h) Acute Yellow Atrophy	3	4	3
(i) Sprue	—	—	—
(j) Other Diseases	1089	173	1110
Ear	23	—	23
Eye	272	—	297
Generative System—	—	—	—
Male Organs	563	16	577
Female Organs	968	39	967
Lymphatic System	78	1	81
Mental Diseases	—	—	—
Nervous System	414	50	446
Nose	21	—	21
Organs of Locomotion	143	9	152
Respiratory System	1104	350	1185
Skin—	—	—	—
(a) Scabies	—	—	—
(b) Ringworm	—	—	—
(c) Tinea Imbricata	—	—	—
(d) Favus	—	—	—
(e) Eczema	25	—	27
(f) Other Diseases	629	24	706
Urinary System	515	163	534
Injuries, General, Local—	768	5	793
(a) Striasis (Heatstroke)	—	—	—
(b) Sunstroke (Heat Prostration)	—	—	—
(c) Other Injuries	—	—	—
Parasites—	11	—	11
Ascaris lumbricoides	36	2	40
Oxyuris vermicularis	1	—	1
Dochmius duodenalis, or Ankylo-	—	—	—
stoma duodenale	413	59	427
Dracunculus medinensis (Guinea	—	—	—
worm)	—	—	—
Tape worm	—	—	—
Poisons—	—	—	—
Snake bites	5	—	5
Corrosive Acids	1	—	1
Metallic Poisons	2	2	2
Vegetable Alkaloids	13	—	14
Nature Unknown	—	—	—
Other Poisons	29	1	29
Surgical Operations—	1207	73	1207
Amputations, Major	—	—	—
" Minor	—	—	—
Other Operations	—	—	—
Eye	—	—	—
(a) Cataract	—	—	—
(b) Iridectomy	1	—	1
(c) Other Eye Operations	17	—	17

largely due to the fact that two special searchers have been employed on a monthly salary, who have been sent to visit different districts, from time to time, with the definite object of sending all cases, as far as possible, to hospital. It is satisfactory to note, however, that, as shown by the following figures, although temporary increases have occurred, yet on the whole there has been a progressive reduction in the number of cases under treatment in the districts at the end of the year (March 31) during the last seven years: 1901, 475, 1902, 276, 1903, 261, 1904, 304, 1905, 204, 1906, 154, 1907, 230.

The returns from Districts 3 and 4 in Tobago show a substantial reduction in the number of cases as compared with the previous year. All cases occurring in Districts No. 1 and 2 are, as heretofore, treated in the hospital.

B—Conditions Affecting the Public Health

Substantial progress has been made in the works undertaken for improving the sanitary condition of Port-of-Spain. About one third of the premises in the town have been connected with the new sewerage system.

The grading of the streets in Old Woodbrook has been completed and concrete gutters provided, and a large portion of the low lying lots near the sea have been filled up. Substantial progress has been made in the scheme for improving the condition of Belmont by concreting the principal ravines draining into the Dry River. When this work is completed, and the proposed intercepting sewer along the eastern bank of the Dry River is laid, the sanitary condition of this district should be greatly improved.

A few improvements are reported from country districts, viz., the laying of additional side drains in St. Joseph, Tunapuna, and Couva.

Water Supply—The supply of potable water in many of the country districts continues to be the subject of complaint, and is no doubt responsible for much of the sickness which occurs there. Sites have been indicated by the Government geologist for wells at Siparia, Cedros, Toco, Mayaro, and Guayaguayare, and wells have been sunk in the two first mentioned districts, but the water obtained has not been satisfactory. In such localities large concrete cisterns for storing rain-water in connection with Government buildings, as at Couva, would seem to be the best method to adopt to supply this want.

INSTITUTIONS

Colonial Hospital—Port-of-Spain

The completion of the installation of the sewerage throughout the institution was effected, to the great improvement of the comfort of the patients and the sanitary conditions of the institution.

The mortuary has been enlarged and improved, and equipped with modern tables and sanitary fittings. The number of admissions has been kept well within the authorized complement of beds throughout the greater portion of the year.

The observation ward for cases of mania, presumably temporary, has proved of great utility, and has undoubtedly been the means of preventing the admission of unsuitable cases to the lunatic asylum.

It is satisfactory to report that the objectionable

practice of treating cases of tuberculosis in the general wards of the hospital has now definitely ceased, separate male and female wards having been set aside for the reception of these cases.

Colonial Hospital—San Fernando

The male wards were thoroughly repaired and painted during the year, as also the resident surgeon's quarters and the operation room on the male side. The most pressing requirements at present are quarters for the assistant surgeon and fencing in of the grounds.

The number of admissions during the year has been kept strictly within the authorized limit. Some improvements in the sanitary arrangements, as indicated in the report of the resident surgeon, have been provided for during the present year.

District Hospitals

Extracts from the reports of the medical officers in charge are appended.

The necessity for increased accommodation at the Anna District Hospital has been for some time evident, mainly owing to the rapid growth of the Manzana District, and provision has been made for the enlargement of the female ward by the addition of eight beds during the present year.

As pointed out in the report of the District Hospital, Couva, the necessity for incinerators for the disposal of the nightsoil of these hospitals is urgent.

The medical officer in charge of the Tobago Yaws Hospital calls attention to the very insufficient water supply, resulting in a very heavy expenditure for the cartage of water. This matter has formed the subject of special correspondence on several occasions, and a proposal was put forward by the Director of Public Works for conveying water from the spring on the lands of the Government Farm by means of an aeromotor, but for some reason this has not been carried out.

Lunatic Asylum

The report of the medical superintendent is appended.

There has been a gratifying improvement in the health of the inmates and in the percentage of mortality during the year. The opening of the observation ward at the Colonial Hospital has proved of benefit in excluding unsuitable cases, although the medical superintendent reports that a considerable number of such cases continue to be sent, chiefly from the country districts.

The removal of upwards of fifty imbecile and senile cases to the new wards at the House of Refuge has afforded sensible relief to the overcrowding, although, as pointed out by the medical superintendent, the excess of inmates over the accommodation on the male side is still large, and, in view of the steadily increasing number of admissions, the necessity for providing increased accommodation is urgent. Provision was made in the annual estimates for completing the installation of the sewerage system, but for financial reasons the work has not been as yet undertaken. The need of these improvements is very urgent, in view of the large number of inmates and employees and the present insanitary method of disposing of the nightsoil.

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(continued)

The water supply of the district is in much the same condition as it was last year. At Siparia a deep well was dug, and a pump installed in it, but after a few weeks use the pump broke, and it has not since been repaired.

Districts of Cedros and Erin

Not a single month of the twelve under review can be said to have been healthy. Sickness prevailed the whole time, being particularly abundant during the months of July, August and September. In Cedros there was hardly any difference, during the first three-quarters of the year, with regard to the mortality, which was low compared to the number of persons who suffered from illness during the respective periods, but the mortality was comparatively high during the remaining part of the year—January, February and March. In Erin the number of cases of sickness which proved fatal was significantly large.

Malarial fever was rampant as usual, causing a great deal of suffering, and proving a lethal scourge to an appreciable number of individuals, especially among the old and debilitated Indian immigrants. In many instances it was of a severe type, one case which rapidly succumbed being of the pernicious variety. A case of hæmoglobinuric fever occurred at Erin, and was fast passing away when it came under my notice. I had the patient at once transferred to the Cedros District Hospital, where he made a rapid recovery. Respiratory diseases were common, but happily only three were caused by the tubercle bacillus. Sunstroke, of the hyperpyrexial form, attacked a European who was peculiarly vulnerable to insolation, and quickly terminated in death. Large numbers of people in both districts were subject to a skin disease which appears to have prevailed in other parts of the Colony, and to have been diagnosed for a variety of conditions, including chicken pox. The cases of that disease which came under my observation were found, on careful investigation, to present such characters as left little doubt of the identity of the condition with pemphigus contagiosus. I still hold to the opinion that the disease in question was pemphigus contagiosus.

The want of potable water is still greatly felt in Cedros and Erin. Great hopes of an abundant supply of good drinking water for Beaulieu, the principal village of Cedros, were entertained when the warden had a well dug on a site marked out by the Government geologist, but, although much money was spent and water was found, the latter, on analysis by the Government analyst, was declared to be unfit for drinking purposes. Since that disappointing experiment no other attempt has been made to obtain a suitable water supply in these districts. I am strongly of the opinion that wells will not prove generally successful in this part of the island, and I would urge that the recommendation made by me in former annual reports as to the construction of concrete cisterns for storing rain-water be carried out, such a scheme being certain to give more satisfactory results, and in no way liable to involve the total loss of considerable sums of public money. In the village of St. Francis,

Erin, on the site from whence the constabulary station has been recently removed, there are two concrete cisterns in good condition that are capable of holding sufficient rain-water for the use of those residents who are not otherwise provided with good drinking water. The cost of connecting them with the down-pipes of the adjoining public buildings and converting them into public cisterns would be small, and in view of the benefits to be derived therefrom, I earnestly advise that such an easy, cheap and suitable means of securing a public water supply for that village be made use of without further delay.

Districts 1 and 2, Tobago

The general health of these districts was, on the whole, good, and there was no epidemic of any disease. These were, as usual, gastro intestinal complaints among children and infants, and the benign form of malarial fever.

The water supply was fairly good, but in the drier months the inhabitants had, as usual, to depend mainly on springs, which, however, are kept in good condition by the authorities.

No 3 District, Tobago

The year has been an unhealthy one, and has been characterized by the incidence of an unusually large number of cases of alimentary disorders—diarrhoea and dysentery principally, with a correspondingly large percentage of deaths. Of individual months August was particularly unhealthy, the deaths then being nearly double those of any other month. Of the total number of deaths, thirty-eight took place in persons over 60, twenty-five in children under two weeks, and sixty eight, including the former, in children under 5 years.

The number of pauper cases attended to were 1,292, and forty-one persons received medical aid on poverty certificates. This is a considerable falling off from last year, when 1,770 paupers were attended. The diminution in the number is most marked from September 1, when the system of issuing certificates by the Warden's Department was inaugurated. During the first five months—April to August—942 pauper cases were attended, while during the subsequent seven months the number fell to 371.

The fact that only forty-one persons availed themselves of the use of "poverty" certificates, and that quite a number not only failed to pay the nominal sum of 6d chargeable for medical attendance, but, when this was not insisted on, failed to have the prescriptions made up, because of the 6d due for medicines, in conjunction with the above figures, may be taken as a measure of the demoralization wrought by the Tobago Medical Aid Ordinance.

Two hundred and thirty-five cases of yaws were treated during the year. Of these sixty six were remaining under treatment from last year, 169 were new cases, of which thirty-two were recurrent. Of the recurrent cases, twenty-seven were recurrences from hospital, and two were from my predecessor's time. Of the large number of recurrences in cases treated in hospital I shall have occasion to speak further on. Of the total number, 103 cases were

cured in the district, 107 were sent to hospital, and twenty five remain under treatment in the district

I subjoin figures for the past year, from March 31, 1906, to March 31, 1907. Remaining under treatment on March 31, 1906, 66, fresh cases from March 31, 1906, to March 31, 1907, 169, new, 137, recurrent, 32, cures in district, 103, sent to hospital, 107, still under treatment, March 31, 1907, 25

From the above figures it will be seen that not only is there a substantial decrease in the number under treatment in the district during the year under review, but that there was a considerable diminution in the number of cases reported for the year

Enteritis, gastro-enteritis, dysentery, were the most prevalent diseases

The very large number of bowel complaints this year lends special emphasis to my last year's remarks on the subject of water pollution, to which I have no doubt they are directly to be attributed. Though the natural supply of water in this district is both ample and excellent, the contamination it is open to is deplorable

As I pointed out in my last year's Annual Report, in consequence of the hilly nature of the country, the absence of cesspits—their only representatives being, as a rule, crude structures placed on the bare ground, and almost invariably open to the visits of fowls, pigs, &c—structures which scarcely subserve to any appreciable extent the demands of decency, and certainly never these of sanitation, the rivers become, as a rule, sooner or later the boue to which a great deal of the sewage of the district is conveyed by the storm waters, with the result that during seasons like that through which we have just passed the prevalence of this particular class of disease is appalling

Washing in the rivers is a very general practice, and one apparently that no effort is made to check

That the services of at least one inspector possessed of sanitary knowledge is required in this district goes without saying, and though the ward officers of the districts are, I understand, supposed to act as sanitary inspectors, it is doubtful whether they possess the requisite knowledge, or would have the time to satisfactorily perform the duties if they did

As this class of disease always exacts a high toll of victims, not only because of the ignorance of the people of those indispensable adjuncts to successful medical treatment, *i.e.*, careful feeding and nursing, but because, as a rule, the condition is made light of in the first instance, and medical aid only sought when the patient is recognized as being in grave danger, it becomes the more necessary that prophylactic measures—of which proper sanitation may be regarded as the very basis—should be utilized to the utmost

Malarial fever prevailed to a slightly larger extent than last year, and there were a few more deaths due to it. It is to be regretted that, in view of our present knowledge, it is not classed among infectious diseases, and the same precautions taken to prevent its spread as is done in the case of yellow fever. No case of hæmoglobinuric fever (blackwater) came under my notice during the past year

Children are, as a rule, the principal sufferers from worms, anæmia, and general malnutrition, the con-

dition of general ill-health resulting being known locally as *maasmus*. There is very little flesh that I can add here to my remarks of previous annual reports. I have to record my regret, however, at the considerable decrease in the number brought for treatment since September last, when the system of issuing pauper and poverty certificates by the Warden's Department was inaugurated

There can be no doubt that there is a terrible loss of infant life in this district, as in the Colony generally, as a result of unskilful, not to say improper, treatment during parturition, and indifferent care and improper feeding during the early years of childhood

The number of cases of pulmonary affections met with during the year was small, and the proportion of phthisical cases among them was, as usual, insignificant—a result, no doubt, of the maritime climate. Only three persons died from the latter disease, and of these it is certain one case contracted it in Trinidad

Tubercular ulcers, as usual, formed a large proportion of the cases treated during the year. Of their extraordinary wide prevalence I have had occasion to speak again and again. They are essentially cases which call for hospital treatment, but from their very general occurrence and more or less chronic character it is impossible to afford more than a moderate proportion of them this relief

I would again beg to direct attention to the great need of some form of ambulance in this district, a want equally felt throughout the island, I have no doubt

The system of affording medical relief only on certificates issued from the Warden's Department, which came into practical operation in September last, has been the means of checking the too often dishonest representation of pauperism set up so frequently where children were concerned, and should in time help to create a healthier consciousness of individual responsibility. On the other hand, there can be no doubt that the trifling obstacle presented by the necessity of obtaining these certificates, and in some cases of paying the small sum of one shilling where the individual was not a pauper, has led to a considerable and much to be regretted neglect of children

That the benefits of the present system of "poor relief" would be greatly enhanced by the inclusion in it of such a system as that which, I believe, in Grenada is known as the "delayed payment system," I have had occasion to point out in previous reports. I avail myself of this opportunity of again calling attention to it

Were a Government dispensary established in this district, as has been done in the No 4 District, and as I rather understood was contemplated last year, there can be no doubt that it would be a veritable boon to the inhabitants. Its need is greatly felt

No 4 District

The health of the district has been good. There were 675 paupers treated during the year, and three persons treated on poverty certificates

The yaws returns for quarter ending March I here-
with enclose

There have been 252 recurrent cases made up as

follows At Speyside, 6, Roxborough, 95, Charlotteville, 29, Mount St George, 30, Pembroke, 92 Total for the year, 252

Summary of mortality in Port of-Spain for twelve months ending March 31, 1907 Number of deaths of residents Male, 946, female, 963, total, 1,909, death-rate, 31.81, death rate for twelve months ended March 31, 1906, 32.48 The highest mortality occurred in January, 1907, the lowest in September, 1906 The subjoined table details the monthly mortality —

Month	Male	Female	Total	Rate per 1,000
April	79	68	147	29.4
May	77	79	156	31.2
June	86	89	175	34.0
July	85	94	179	35.8
August	71	91	162	32.4
September	64	69	133	26.6
October	66	68	134	26.8
November	80	84	164	32.8
December	84	70	154	30.8
January	93	96	189	37.8
February	78	89	167	33.4
March	83	66	149	29.8
	946	963	1,909	

The principal causes of death were —

		Rate per 1,000
Communicable and Septic Diseases	128	2.13
Constitutional Diseases	83	1.38
Tubercular	315	5.25
(Phthisis Pulmonalis)	(284)	4.73
Malarial Fever	78	1.3
Diseases of the Nervous System	90	1.5
„ Circulatory „	83	1.38
„ Respiratory „	145	2.41
(Pneumonia)	(51)	0.85
Diseases of the Alimentary System	389	6.48
(Diarrhoea)	(150)	2.5
Diseases of the Urinary System	122	2.03
„ Reproductive System	19	0.31
„ Integumentary „	1	—

		Rate per 1,000
Dietetic Diseases	4	—
Developmental Diseases	328	5.46
Malignant „	35	0.58
Dysentery	47	0.78
Parasitic Diseases	22	0.36
Accidents and Injuries	6	0.1
Judicial Executions	2	—
Diseases of Joints and Bones	4	—
Ill defined	7	0.11

RETURN OF INFANTILE MORTALITY FOR THE YEAR 1906 1907

Diseases	Age Periods					Total
	Under 1 months	1 to 3 months	3 to 6 months	6 to 9 months	9 to 12 months	
Diarrhoeal Diseases	21	58	68	28	31	206
Other Diseases of Alimentary System	5	4	1	1	2	13
Lung Diseases	5	12	12	9	7	45
Premature Birth	40	3	1	2	2	48
Tuberculosis	2			3	5	10
Debility	32	12	3	1	2	50
Tetanus Neonatorum	29					29
Malnutrition	2	5	7	1	1	16
Congenital Syphilis	1	3	4	2	2	12
Marasmus	—		5	7	5	17
Influenza			1			1
Typhoid Fever		2	1	2	2	7
Infantile Convulsions	7	2	1	1	1	12
Cerebral Haemorrhage	1					1
Meningitis		1	1	1		3
Congenital Nervous Disease	1					1
Congenital Heart Disease	1					1
Malarial Fever		2	4	4	4	14
Anæmia		2				2
Tumour of Orbit		1				1
Acute Nephritis		1				1
Infantile Atrophy			2		1	3
	147	108	111	62	65	493

Colonial Medical Reports.—No. 14.—St. Lucia.

REPORT ON THE HOSPITALS AND DISPENSARIES, 1906

By STANLEY BRANCH, M B

DURING the year 1906, 1,362 cases were admitted into the hospital. There were 105 deaths, a death-rate of 7.34 per cent. The death rate of the institution must be high, and will, I fear, go higher still, as there does not appear to be sufficient accommodation in the Poor Asylum for those chronically ill who wish to pass their remaining days in hospital.

The deaths from phthisis, syphilitic cachexia, old age, and heart disease number no less than thirty-two. Owing to the frequency of deaths within twenty-four hours of admission, no patient is entered on the books who does not live six hours after he is brought in.

It seems hard to believe that in St. Lucia there are two distinct diseases, each presenting the same clinical features manifesting the same spirochæte, and amenable to the same treatment. Here again I would like to enter a plea in favour of the recognition of the syphilitic nature of yaws, and the adoption throughout the island of the same specific line of treatment. There is a yaws asylum, which the Colony has maintained for years, where cases of leprosy, tertiary syphilis, and so-called yaws are heided together. During these years there has been great diversity of opinion as to the method of treatment. In 1884 "there seems to have been moderately rapid and marked improvement" after the introduction of a mixture containing iodide of potassium, bichloride of mercury and arsenic, between 1889-95 the asylum was gradually being closed, only between thirty and forty cases treated yearly, in 1897 thyroid gland was vaunted as a specific, in 1898, owing to the expense of the "old yaws mixture," an economic process of treatment by iron, arsenic, and sea bathing was substituted, to be followed in 1901 by the introduction of cacodylate of soda. There has been apparently all through a line of action by tonics, improving the general health, and discharging the patient when the actual frambæcial lesions had subsided. Consequently there are to-day hundreds of cases of untreated syphilis bearing all the marks of facial disfigurement, scarring, and contractions, and the various manifestations of severe and extreme tertiaries.

I would like to suggest that all lesions hitherto considered as yaws be recognized as syphilis, and that a rigorous and uniform treatment by mercury and iodide be followed during the next ten years aiming at the eradication of individual taint. To this end I beg to offer the following remarks, the result of my own experience. The West Indian negro is very susceptible to mercury, except the bichloride, which can be given in adults in doses of 3 grains to 1 drachm three or four times daily, and for long periods, inunction with ung. hydrag. 1 part and olive oil 3 parts once or twice daily is also a valuable form of administration.

Iodide of potassium for the control of osteocopic pains or gross tertiary lesions can be pushed to any extent. There is now in the Victoria Hospital an adult male who for six weeks lay unconscious from gumma of the brain, he awoke under the exhibition of 2 to 3 drachms of iodide per day. In infants, hydrag. cum ciet in combination with fer. carb. sacch., or inunction of ung. hydrag. in cod liver oil, gives us very good results.

Report by Digby Macphail, M B, C M, Medical Officer, Castries District

During the whole course of this year the chief disease encountered was malaria in its various forms and sequelæ. The influence of the season did not appear to have much effect either on the number or the severity of the cases. Although the mortality from malaria *per se* was not heavy in this district, its poison often leads to a general breakdown in health which renders the patients more liable to the attacks of other diseases, and less able to withstand them. Mosquito breeding grounds abound in the district, and will continue so until the inhabitants are taught to see that it is for their own benefit to keep their yards and houses clean and free from stagnant water. This will, I think, have to be done by legislation, as, from my experience here and elsewhere, it is an almost impossible thing to persuade the average peasant (and this is not so much to be wondered at) that "fever" can be carried from one person to another by the little insect. In time I have no doubt he will appreciate it. In the meantime, regulations could be framed and carried out by the Board of Health with the view of the extermination, as far as possible, of the mosquitoes.

In my last report I had to draw attention to the very great prevalence of intestinal parasites, and I beg to reiterate what I wrote last year. Ankylostomiasis is prevalent, but in the absence of competent nursing it is a matter of considerable risk to treat these cases properly at their own homes, and here, as in other places, it is not often easy to persuade them to go to hospital. The sanitary arrangements in most of the dwellings of the peasantry are crude, and not considered by them of sufficient importance to pay much attention to. If school children could be taught (by precept and example) a few very simple sanitary principles, I believe in a very few years a great benefit would be reaped.

Venereal diseases are certainly very common, but I think that Castries compares favourably with other seaport towns in this respect.

From my experience, the disease of yaws is extremely rare, at least in this district.

Colonial Medical Reports—No 14—St Lucia (*continued*)

During the middle of the year diseases of the bowels, chiefly confined to the small intestines (though in some cases dysenteric symptoms were present) were very prevalent. The weather was very hot and rains were frequent. I could not arrive at the conclusion that the pipe water supply was in any way at fault. I found that persons outside the limits of the water supply, and who did not drink pipe water, were also sufferers. At the same time, I advised the boiling of all water used for drinking.

Towards the latter part of the year there was a mild epidemic of chicken-pox, and influenza was also prevalent.

Vaccination has been regularly performed during the year.

The cases at Gros Islet Dispensary in 1906 were Malaria, 231, intestinal parasites, 173, syphilis, 45, diseases of digestive system, 33, respiratory system, 23, circulatory system, 30, urinary system, 4, nervous system, 16, skin, 21, eye, 13, ear, 4, throat and nose, 1, generative organs, 17, glands, 3, rheumatism, 13, senility, 10, injuries, 2, undefined, 15. Total, 654.

Report by Alex. King, M.B., Ch.B., D.P.H., Medical Officer, Castries Medical District

The Registrar's returns for the year show a decreased number of deaths, a decreased death rate, and a decrease in infantile mortality.

During the year Castries has admittedly passed through a crisis. Following on the cessation of military works, and again on the withdrawal of the garrison, work, money, and even sometimes food have been more scarce than for some years previously. There has been considerable emigration, as is plainly shown by the number of houses "to let" and "for sale" throughout the town and neighbourhood. Now, no exact figures for emigration or immigration can be got (there is little doubt that the former has far exceeded the latter), therefore the Registrar must perforce calculate upon "natural increase," *i.e.*, the excess of births over deaths, and by so doing he has obtained the above satisfactory results. But these results are open to doubt.

On the basis of the last census the population of the Castries quarter for the last three years has been given at 19,989, 20,459, and 20,601 respectively, with death-rates of 22.4, 22.5, and 21.1 per 1,000. The actual number of marriages has been greater each year than the last, and for 1906 the ratio of illegitimate to legitimate births has increased, yet the number of births has steadily decreased from 756 to 690 and to 635. Birth rate does not fluctuate much in any community without very apparent reasons, and indeed forms a useful basis on which to calculate population between census years. Assuming the 1904 estimate of the population to have been correct with 756 births for the year, the 1906 population would be, calculating in this way, more nearly 16,790, and the death rate for the year approximately 29 per 1,000, instead of 21.1, which would mean that there is room for much improvement in the state of the public health.

The infantile mortality shows a real decrease, but

is still enormous. In 1904 it was 272 per 1,000 births, in 1905, 298, last year, 266. The change is in the right direction, and, considering the economic conditions of the past year, is a matter for congratulation. The reason is apparently ignorance and carelessness on the part of the relatives, and the causes of death usually are diarrhoea and parasites. Malaria does not seem to be very fatal among the Castries children, while the other diseases of childhood, such as measles, whooping cough, and chicken pox, are almost invariably mild. If the relatives would seek medical aid sooner, lives would be saved, as it is, one seldom sees a child till it is critically ill, and various kinds of "bush" have proved ineffectual.

It is noted in the medical papers that an infantile mortality of 286 per 1,000 in Georgetown, Demerara, has appeared so serious that a Commission has been appointed to enquire into the reasons. So far, I believe, the report is not published.

The general sanitary state of the town is still much the same. Tanks, wells, and "stegomyia" still abound, there is no modification of the sewage system. The Ravine Grognet and similar places on the outskirts of the town are no less offensive in dry weather, so apparently they are still a dumping-ground for filth of all kinds.

The prevailing diseases are again intestinal parasites, malaria, and venereal disease. A bad type of malaria is common in returned canal labourers, who not infrequently have ankylostoma as well. The latter seems to be universal in returned Cayenne gold-diggers. So, though these people bring money home to their friends, they bring disease as well, and probably leave it behind as a legacy when they emigrate once more.

The Babonneau Dispensary was opened on September 14, and, owing to the illness of the medical officer of the district, I attended till the end of the year. Eighty-six persons attended the dispensary, and 15 returned for a second or third time, the total 103 giving for the ten visits paid an average attendance of 10.3. An analysis of the diseases follows—

Ascarides ("worms"), 16, ankylostomiasis, 11, malaria, 12, disease of digestive system, 10, anaemia, 6, disease of female organs, 5, skin, 4, respiratory system, 2, nervous system, 3, eye, 1, ear, 1, whooping-cough, 1, rheumatism, 1, syphilis, 1, tuberculosis, 1, leprosy, 1, debility, 1, senility, 3, ulcer, 1, enlarged glands, 1, no appreciable disease, 4. Total, 86. There were few cases of acute disease.

Intestinal parasites in children were responsible for the largest number under one heading. Malaria follows next, but in this district it appears to be of a very mild type. Next in order comes ankylostomiasis. The figures given certainly do not represent the true prevalence of the parasite, as, without microscopic diagnosis, only fairly advanced cases can be identified. Many of the cases were suggestive of this condition, but were not sufficiently marked to be included in the returns as such on purely physical diagnosis. Digestive diseases, principally in children, come next. The usual mistaken notions of infant feeding prevail at Babonneau. Venereal disease would appear to be rare in this quarter, judging from the number seen, one of which was a case of congenital syphilis. One leper was seen.

RETURN OF DISEASES AND DEATHS IN 1906 AT THE FOLLOWING INSTITUTIONS —

Victoria Hospital, Lunatic Asylum, Soufriere Casualty Hospital, Poor Asylum, Vieux-Fort Hospital and the Dennery Hospital

GENERAL DISEASES				GENERAL DISEASES—continued			
	Admissions	Deaths	Total Cases Treated		Admissions	Deaths	Total Cases Treated
Alcoholism	10	—	10	(d) Typhus Mesenterica	—	—	—
Anæmia	—	—	—	(e) Tuberculous Disease of Bones	—	—	—
Anthrax	—	—	—	Other Tubercular Diseases	—	—	—
Beri beri	—	—	—	Varicella	—	—	—
Bilharziasis	—	—	—	Whooping Cough	—	—	—
Blackwater Fever	—	—	—	Yaws	47	—	69
Chicken pox	—	—	—	Yellow Fever	—	—	—
Cholera	—	—	—				
Choleraic Diarrhoea	—	—	—	LOCAL DISEASES			
Congenital Malformation	—	—	—	Diseases of the—			
Debility	24	7	31	Cellular Tissue	21	—	25
Delirium Tremens	—	—	—	Circulatory System—	—	—	—
Dengue	—	—	—	(a) Valvular Disease of Heart	8	7	8
Diabetes Mellitus	—	—	—	(b) Other Disorders	2	—	2
Diabetes Insipidus	—	—	—	Digestive System—	51	16	58
Diphtheria	—	—	—	(a) Diarrhoea	—	—	—
Dysentery	—	—	—	(b) Bill Diarrhoea	—	—	—
Enteric Fever	8	5	10	(c) Hepatitis	—	—	—
Erysipelas	1	—	1	Congestion of the Liver	—	—	—
Febricula	—	—	—	(d) Abscess of Liver	2	—	3
Filariasis	—	—	—	(e) Tropical Liver	—	—	—
Gonorrhoea	4	1	5	(f) Jaundice, Catarrhal	—	—	—
Gout	1	—	1	(g) Cirrhosis of Liver	—	—	—
Hydrophobia	—	—	—	(h) Acute Yellow Atrophy	—	—	—
Influenza	—	—	—	(i) Sprue	—	—	—
Kala Azar	—	—	—	(j) Other Diseases	—	—	—
Leprosy	—	—	—	Ear	—	—	—
(a) Nodular	2	1	10	Eye	20	—	21
(b) Anæsthetic	—	—	—	Generative System—	—	—	—
(c) Mixed	—	—	—	Male Organs	13	1	13
Malarial Fever—	—	—	—	Female Organs	10	—	10
(a) Intermittent	—	—	—	Lymphatic System	—	—	—
Quotidian	—	—	—	Mental Diseases	11	4	32
Tertian	202	10	209	Nervous System	45	8	48
Quartan	1	—	1	Nose	—	—	—
Irregular	—	—	—	Organs of Locomotion	4	—	4
Type undiagnosed	24	—	24	Respiratory System	29	11	33
(b) Remittent	—	—	—	Skin—	25	1	29
(c) Pernicious	2	2	2	(a) Scabies	—	—	—
(d) Malarial Cachexia	—	—	—	(b) Ringworm	—	—	—
Malta Fever	—	—	—	(c) Tinea Imbricata	—	—	—
Measles	—	—	—	(d) Favus	—	—	—
Mumps	—	—	—	(e) Eczema	—	—	—
New Growths—	—	—	—	(f) Other Diseases	—	—	—
Non malignant	7	—	8	Urinary System	33	10	36
Malignant	9	4	9	Injuries, General, Local—	47	3	51
Old Age	15	7	18	(a) Sunstroke (Heatstroke)	—	—	—
Other Diseases	21	2	25	(b) Sunstroke (Heat Prostration)	—	—	—
Pellagra	—	—	—	(c) Other Injuries	13	—	14
Plague	—	—	—	Parasites—	11	2	14
Pyæmia	1	1	1	Ascaris lumbricoides	5	3	5
Rachitis	—	—	—	Oxyuris vermicularis	—	—	—
Rheumatic Fever	3	—	3	Dochmius duodenalis, or Ankylostoma duodenale	431	8	438
Rheumatism	15	2	21	Dræunculus medineensis (Guinea worm)	—	—	—
Rheumatoid Arthritis	—	—	—	Tape worm	—	—	—
Scarlet Fever	—	—	—	Poisons—	—	—	—
Scurvy	—	—	—	Snake bites	—	—	—
Septicæmia	—	—	—	Corrosive Acids	—	—	—
Sleeping Sickness	—	—	—	Metallic Poisons	—	—	—
Sloughing Phagedæna	—	—	—	Vegetable Alkaloids	—	—	—
Small pox	—	—	—	Nature Unknown	—	—	—
Syphilis	—	—	—	Other Poisons	—	—	—
(a) Primary	30	2	36	Surgical Operations—	—	—	—
(b) Secondary	116	11	130	Amputations, Major	8	—	8
(c) Tertiary	100	—	111	Minor	18	—	18
(d) Congenital	6	2	7	Other Operations	101	7	101
Tetanus	1	1	1	Eye	—	—	—
Trypanosoma Fever	—	—	—	(a) Cataract	—	—	—
Tubercle—	11	4	13	(b) Iridectomy	—	—	—
(a) Phthisis Pulmonalis	38	11	40	(c) Other Eye Operations	—	—	—
(b) Tuberculosis of Glands	—	—	—				
(c) Lupus	—	—	—				

Most of the cases were trivial. The district is a healthy one, and, with the exception of the ankylostomiasis, there is little or no serious disease.

Report by Edwin Wells, M B (Edin), Medical Officer, 2nd Medical District

Lunatic Asylum—Nineteen inmates remained in at the end of 1905, 13 were admitted during the year. Four deaths occurred—3 from melancholia and 1 from delusional insanity.

(b) Owing to the crowded state of the asylum in August, it was found necessary to send some to Grenada. Eight were sent from Soufrière, and were joined by another in Castries, making a total of 9 inmates shipped to Grenada on August 9.

(c) On August 4, Mr J A Jones, Steward and Dispenser of the Lunatic Asylum and Casualty Hospital, unfortunately died at the Victoria Hospital. His place was filled, on September 8, by Mr Orville Blathwaite.

(d) The conduct of the inmates has, on the whole, been good, in one or two exceptions, violence was offered to the keepers and to the cells, which latter had, on several occasions, to be repaired.

(e) The entire staff worked well.

Casualty Hospital—Two patients remained in at end of 1905, 27 were admitted during the year, and 2 died.

Poor Asylum—The year 1906 proved a very busy one for the staff of this institution, the male ward continuing full all through the year, while the female side also had a good supply of patients, 139 cases were treated.

Yaws Asylum—Sixty nine cases were treated as against 83 in 1905. This, however, does not prove the decrease of the disease, as there are many cases in the heights which have not been brought for treatment.

(b) I wish to record my appreciation of the manner in which the staff discharged their duty.

DISPENSARIES

(a) Soufrière 1,245 persons applied for treatment, many of whom had their medicines repeated. Malarial fevers, intestinal parasites, and alimentary disturbances called chiefly for attention.

(b) Anse la Raye 655 people attended this dispensary. The diseases treated were of various characters, the majority being as in Soufrière.

(c) Choiseul 314 cases presented themselves for treatment.

Vaccinations—successful Soufrière, 171, Anse la Raye, 64, Choiseul, 125.

The sanitary condition has, on the whole, been good throughout the district.

In Soufrière there are still some old wells which might with advantage be filled up. No use is made of the water they contain, the Soufrière Waterworks supply such excellent water and in great abundance.

Diseases treated at Soufrière Dispensary during 1906. Alimentary system, 146, respiratory, 69, circulatory, 59, hæmopoietic, 3, nervous, 47, skin and integumentary system, 33, generative organs, male, 4, female, 12, abscess, 6, bones and joints, 2,

malarial fevers, 204, parasites, intestinal, 374, anæmic debility, 28, special senses, 22, mouth and throat, 17, syphilis, 28, rheumatism, 49, ulcers, 60, tumour, 1, abortion, 1, fractures, 3, pregnant, 2, yaws, 11, extractions (teeth), 19, climacteric, 6, diopsy, 10, tubercle, 1, miscellaneous, 28. Total, 1,245.

Diseases treated at Anse-la Raye Dispensary during 1906. Alimentary system, 62, respiratory, 40, circulatory, 17, hæmopoietic, 3, nervous, 15, skin and integumentary system, 27, generative organs, male, 1, female, 4, abscess, 8, bruises and contusions, 7, malarial fevers, 182, parasites (intestinal), 125, anæmic debility, 21, special senses, 10, throat and mouth, 12, syphilis, 8, rheumatism, 26, ulcers, 32, pregnant, 1, hernia, 2, urinary system, 10, leprosy, 1, extractions (teeth), 22, not ill, 10, miscellaneous, 9. Total, 655.

Diseases treated at Choiseul Dispensary during 1906. Alimentary system, 41, respiratory, 16, circulatory, 24, hæmopoietic, 14, nervous, 13, generative organs, male, 4, female, 4, abscess, 2, malarial fevers, 29, skin, 8, parasites (intestinal), 56, anæmia and debility, 17, special senses, 7, mouth and throat, 4, syphilis, 10, rheumatism, 18, ulcers, 11, tumour, 1, yaws, 4, pregnant, 2, extractions (teeth), 11, climacteric, 3, diopsy, 3, urinary system, 4, elephantiasis, 1, club foot, 1, miscellaneous, 6. Total, 314.

Report by J A Lestrade, Medical Officer, Medical District, Vieux-Fort

At the beginning of the year 4 males remained in Vieux Fort Hospital, 30 males and 14 females were admitted during its course, and 3 females and 1 male remained at its end. There was a daily average of 3 in hospital, this being due to orders from Your Honour to limit the number of patients to four daily, the place being now used as a casual hospital and feeder, as it were, to the Poor Asylum. Twenty males and 8 females were discharged cured, 6 males and 3 females relieved, and 5 males not improved. The number who died was 2, these being cases of malignant malarial fever, 1 in June and the other in September. Both died soon after admission.

The diseases treated were principally fevers, with the 2 deaths, the other admissions being for various complaints, with no great preponderance in any of them over the other.

The Vieux-Fort Dispensary was well attended by the inhabitants, 1,481 availing themselves of it. The principal diseases treated were fevers, digestive and respiratory diseases, and the ubiquitous worm parasites, chiefly the lumbricoid, or round worm.

Vaccination was poor, this might be due to the illness of the medical officer at the middle of the year, and to his not insisting, during the latter part of it, that the parents, owing to the fever being then rife in the quarter, should bring their children for it. Seventy-two were vaccinated.

Four hundred and ninety people availed themselves of dispensary treatment at Labouie Dispensary, principally children, as was the case also in Vieux-Fort. The diseases, as will be seen in Table (C), were principally worms, fevers, and bowel complaints. As it will be perceived, fever is not by a long way as

prevalent here as in Vieux-Fort, but it is on the increase, while in Vieux Fort it is rapidly decreasing. Vaccination was below the average, but better than at Vieux Fort. Eighty eight children were vaccinated.

The health of the district generally has not been good, malarial fever was rife, and this, with influenza, culminated into an epidemic which raged in July onward till the end of year. Its severity was greatest in the third quarter of the year, and caused many deaths. The other diseases were slightly in excess also, and this can be easily understood, the debilitating effects of the epidemic giving them a wider field to work upon.

The sanitary condition, or rather the conservancy of the district, was good, the town of Vieux Fort being remarkable in this, but owing to several reasons—first of all the almost daily seismic disturbances we experienced (for I believe diseases with a high death-rate were general over the island, and not peculiar to Vieux Fort alone), the early and abnormal rains, the plague of mosquitoes, and the unusual high level of the swamp waters, together with the cold and biting high winds, with rapid evaporation of the groundsoil water and consequent miasmata—we have not so suffered in health, in my experience, for the last seventeen years or thereabout, when influenza, in its now recognized virulent form, first declared itself here, and several of the leading inhabitants suffered and died of it.

As for fevers, malarial and otherwise, so long as we have these swamps in the district, so long will epidemics more or less severe in type and extent recur, and, unless something be done to them, we have no right to be surprised when they do occur. The wonder is that the town and country round are so often so remarkably healthy to most people. The town and surroundings have great possibilities of health, were they not negatived by the miasmata and other inconveniences engendered by them.

As for the diseases of the digestive organs, the water supply is blamed for that by some wiseacres, and even fevers are ascribed to its influence. I think this erroneous, dangerous, and unscientific. The river is a fast-running stream, and the bed and banks are mostly of gravel and fine sand, and generally shallow, especially where the people take their water. This allows of rapid oxygenation and its constant purification, and unless it can be proved that it habitually contains irritating and decomposing germs, it is difficult to see how its comparative purity can be questioned. At times, however, it is very dangerous, but these are the very times when the people do not, or ought not to, want the water, as then the rains fully supply them with good potable water. It is true that the river, passing in cultivated lands, will contain both organic and other impurities, but this mostly during the rainy season, when the water is overflowing, and its turbidity serves as a danger signal to the people. It will be their own fault if they refuse to learn the lesson Nature is evidently teaching them.

What is practicable is that the Government build public cisterns, if it cannot provide proper water supply, and open these cisterns to the public, with certain regulations and restrictions, at stated times, but at the same time deal more liberally and with less

restrictions during the rainy and therefore generally unhealthy season. If this were carried out, the people could have potable rain water all the year round, and for washing and bathing the river could supply them.

In the matter of sanitation, they should be taught clean and wholesome habits, that the spreading about wholesale of filth is dangerous and a nuisance to others and to themselves, and they are made to pay for it by having all sorts of uncleanly diseases. Particularly children at school should be made to understand the value of washing their hands before and after meals, and many other little things which would materially conduce to their well being. A dirty child should be punished for being so, even to a greater extent than for not knowing his lessons. Should the people in general, and particularly the ignorant, be made to understand these salutary precepts, I believe it would be much more to their welfare than tons of theories and other contested and dubious facts which they cannot, and will never be able to, comprehend.

Diseases treated at the Vieux-Fort Dispensary, 1906: Respiratory, 51, digestive, 85, generative, 31, integumentary, 21, urinary, 6, glandular, 6, nervous, 28, circulatory, 10, auditory, 7, visual, 8, nasal, 1, fevers, 929, worms, 146, anæmia and debility, 28, venereal and syphilis, 14, ulcers, 10, rheumatism, 35, tumours, 5, dropsy, 13, abscess, 3, injuries, 3, locomotory organs, 3, hernia, 2, exanthems (chicken pox), 2, miscellaneous, 34. Total, 1,481.

Diseases treated at the Laborie Dispensary, 1906: Respiratory, 20, digestive, 45, generative, 17, integumentary, 10, nervous, 3, nasal, 1, circulatory, 3, auditory, 3, worms, 163, fevers, 162, ulcers, 7, venereal and syphilis, 6, rheumatism, 19, anæmia and debility, 10, visual organs, 3, dropsy, 6, abscess, 1, senility, 1, malaria, 1, injuries, 2, miscellaneous, 7. Total, 490.

Report by A. F. Hughes, Medical Officer, Fourth District

Only 16 patients were admitted to the hospital during the year under review. This is due to the fact that only four beds may be occupied, and of this number one bed is usually kept vacant for any case of labour or serious accident which may seek admission. On several occasions, though I have advised patients to come into the hospital for treatment, they have refused on the grounds that there are no patients now in hospital, and it would be too monotonous.

In all 1,510 patients attended the dispensaries during the year, as compared with 1,677 in 1905. Of this number fevers represent 363, or 24 per cent, and intestinal parasites 376, or 25 per cent.

There was the usual annual increase of fever cases during the rainy season. There were no diseases of an epidemic nature. There were 172 successful vaccinations performed at Dennery, and 150 at Micoud.

Sanitation—Several visits of inspection were paid to the villages during the year, and I am pleased to report a marked improvement in the condition of the yards. In several instances the "open barrel system" of collecting drinking water has been abandoned. More attention should be paid to the drains, which should be kept free of rubbish, and wherever necessary the gradient should be rectified so as to avoid accumulations of water during the rainy season.

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(continued)

Pathological Department—This was taken over by Government from the Municipality on May 12, on the expiration of the agreement of Dr Finlayson with the Municipality. The working arrangement remains the same, excepting that it is under the control of the Government Medical Department, the Municipality contributing a fixed sum yearly towards the expenditure.

Labuan—The Medical Department, Labuan, has been placed under that of the Straits, and the report thereon appended. No epidemic of infectious or contagious diseases was recorded. The population is estimated at 8,317. One hundred and sixteen births and 161 deaths were registered in 1906, the mortality of infants being over 50 per cent of the total birth rate, which is deplorable. One hundred and sixty-four patients were treated in hospital, with 17 deaths, 4 being due to malaria and 3 to beri-beri.

Miscellaneous—Seven certificates as chemists were issued under the Morphine Ordinance.

Seventy-three medical practitioners stood on the Register on December 31. Of these 2 died during the year.

There were thirty licensed dispensaries on the Register in Singapore, twelve in Penang and two in Malacca. The work involved in inspecting them is getting very heavy and responsible in Singapore. Besides these, several licences for the wholesale trade under the Poisons Ordinance were issued.

APPENDICES

GENERAL HOSPITAL

Report by Dr J Leash, Colonial Surgeon Resident

The work in the wards was fairly light, though the number of admissions was large, the average duration of stay was shorter.

The European seamen's wards were half empty during most of the year, but the officer's wards were well filled.

As building operations of the extension were going

The chief causes of admissions were Injuries 800, malaria 403, venereal diseases 216, insanity 149, bronchitis 93, pneumonia 43, phthisis 40, diarrhoea 71, dysentery 107, beri beri 99, enteritis 5, colitis 8, enteric fever 86, spire 15, tubercle 44, poisons 66, ulcers 83, abscess 50, rheumatism 51, liver abscess 10, appendicitis 8.

One hundred and thirteen operations were performed on patients in the European wards, 201 on patients in the native wards—314 in all.

Among those of interest were Abscess 31, removal of glands 32, amputations 26, trephining 5, harelip 1, excision of eyeball 3, cataract and iridectomy 1 each, liver abscess 10, herniotomy 1, radical cure of hernia 2, hæmorrhoids 18, suprapubic lithotomy 1, appendectomy 2, perityphlitic abscess 7, laparotomy 3, nephrotomy for calculus 1, circumcision 23, ovariectomy 1, hysterectomy 1.

POLICE FORCE

Report by Dr W G Ellis, Police Surgeon

The total number of the force attending the outpatient room at the Central Station was 3,301, as compared with 4,283 for 1905, and 4,096 for 1904.

The greatest number seen on any one day was 27, the lowest 3.

The majority of those attending were suffering from trivial affections, many were malingerers, and many had slight attacks of feverish catarrhs or diarrhoea.

There were 294 sent to the General Hospital as inpatients compared with 335 in 1905, 357 in 1904, 317 in 1903, 350 in 1902, 294 in 1901, 290 in 1900, and 556 in 1899. Others of the Force have been admitted to the General Hospital for treatment having been by inspectors sent as urgent cases. Of these I have no record.

Of the 294 sent to the General Hospital, 19 (as was suspected) were reported to be malingering, the remaining 275 suffered from the following disorders: Unclassed fevers 50, intermittent fever 22, enteric fever 2, pulmonary tuberculosis 4, pneumonia 1, mumps 7, dengue fever 2, bronchitis 18, asthma 2, hepatitis 2, dysentery 19, diarrhoea 27, nephritis 2, dyspepsia 6, rheumatism 11, beri beri 5, synovitis 1,

	Remaining Dec 31, 1903	Admitted in 1906	Total treated	Discharged	Transferred	Absconded	Died	Remaining Dec 31, 1906	Percentage of deaths to total treated
Europeans	25	606	631	561	7	2	38	23	6.022
Natives	104	2,405	2,509	1,909	151	120	245	84	9.764
Native Police	14	357	371	325		37	2	7	0.539
Total	143	3,368	3,511	2,795	158	159	285	114	8.117

on close to seamen's Ward I, this was fortunate, as, for a time, the patients were all moved into Ward II, and were thus little disturbed.

The native wards had always a large number of surgical cases under treatment in them.

The average daily sick was 141.546, against 133.4 in 1905.

There were 3,368 admissions (of whom 265 were females), against 3,042 in 1905.

debility 2, ulcers 11, injuries 7, cellulitis 7, hernia 1, varicose veins 1, syphilis 11, chancroids 6, gonorrhoea and its sequelæ 28, eye affections 4, laryngitis 3, skin diseases 8, abscess 3, nasal polypus 1, hydrocele 1, and tapeworm 1.

Beri-beri, so prevalent two years ago, has been practically stamped out. At least the disease has ceased, as it has in several of the institutions of the town.

RETURN OF DISEASES AND DEATHS IN 1906 AT THE FOLLOWING INSTITUTIONS BUTTERWORTH,
BUKIT MERTAJAM, AND SUNGEI BAKAP HOSPITALS

Province Wellesley, Straits Settlements

GENERAL DISEASES							
	Admissions	Deaths	Total Cases Treated		Admissions	Deaths	Total Cases Treated
Alcoholism	9	—	9	GENERAL DISEASES— <i>continued</i>			
Anæmia	55	14	55	(e) Tuberculous Disease of Bones	2	—	2
Anthrax	—	—	—	Other Tubercular Diseases	2	—	2
Beri beri	39	6	43	Varicella	—	—	—
Bilharziosis	—	—	—	Whooping Cough	—	—	—
Blackwater Fever	—	—	—	Yaws	1	—	1
Chicken pox	—	—	—	Yellow Fever	—	—	—
Cholera	8	6	8	LOCAL DISEASES			
Choleraic Diarrhoea	1	—	1	Diseases of the—			
Congenital Malformation	—	—	—	Cellular Tissue	52	—	54
Debility	66	23	70	Circulatory System—	—	—	—
Delirium Tremens	—	—	—	(a) Valvular Disease of Heart	26	—	30
Dengue	—	—	—	(b) Other Diseases	4	2	4
Diabetes Mellitus	—	—	—	Digestive System—	—	—	—
Diabetes Insipidus	—	—	—	(a) Diarrhoea	108	36	115
Diphtheria	—	—	—	(b) Hill Diarrhoea	—	—	—
Dysentery	117	44	117	(c) Hepatitis	2	—	2
Enteric Fever	2	2	3	Congestion of Liver	7	—	7
Erysipelas	—	—	—	(d) Abscess of Liver	2	2	2
Febricula	21	—	21	(e) Tropical Liver	—	—	—
Filariasis	—	—	—	(f) Jaundice, Catarrhal	1	—	1
Gonorrhoea	14	—	44	(g) Chiriosis of Liver	12	10	14
Gout	—	—	—	(h) Acute Yellow Atrophy	1	—	1
Hydrophobia	—	—	—	(i) Sprue	1	1	2
Influenza	—	—	—	(j) Other Diseases	61	5	61
Kala Azar	—	—	—	Ear	4	—	6
Leprosy	6	1	6	Eye	27	—	28
(a) Nodular	—	—	—	Generative System—	39	—	49
(b) Anæsthetic	—	—	—	Male Organs	—	—	—
(c) Mixed	—	—	—	Female Organs	—	—	—
Malarial Fever—	184	11	187	Lymphatic System	14	—	15
(a) Intermittent—	—	—	—	Mental Diseases	—	—	—
Quotidian	—	—	—	Nervous System	48	10	46
Tertian	—	—	—	Nose	—	—	—
Quartan	—	—	—	Organs of Locomotion	36	—	37
Irregular	—	—	—	Respiratory System	137	46	142
Type undiagnosed	1	—	1	Skin—	—	—	—
(b) Remittent	—	—	—	(a) Scabies	19	—	19
(c) Pernicious	11	5	11	(b) Ringworm	4	—	4
(d) Malarial Cachexia	17	—	17	(c) Tinea Imbricata	—	—	—
Malta Fever	—	—	—	(d) Favus	—	—	—
Measles	1	—	1	(e) Eczema	7	—	7
Mumps	—	—	—	(f) Other Diseases	199	1	226
New Growths—	—	—	—	Urinary System	15	7	21
Non malignant	8	—	8	Injuries, General, Local—	162	2	169
Malignant	1	1	1	(a) Striasis (Heatstroke)	—	—	—
Old Age	20	6	22	(b) Sunstroke (Heat Prostration)	—	—	—
Other Diseases	107	28	112	(c) Other Injuries	—	—	—
Pellagra	—	—	—	Parasites—	—	—	—
Plague	—	—	—	Ascaris lumbricoides	—	—	—
Pyæmia	2	2	2	Oxyuris vermicularis	—	—	—
Rachitis	—	—	—	Dochmus duodenalis, or Ankylo-	—	—	—
Rheumatic Fever	—	—	—	stoma duodenale	—	—	—
Rheumatism	53	—	57	Dracunculus medinensis (Guinea	—	—	—
Rheumatoid Arthritis	—	—	—	worm)	3	—	3
Scarlet Fever	—	—	—	Tape worm	—	—	—
Scurvy	—	—	—	Poisons—	—	—	—
Septicæmia	—	—	—	Snake bites	1	—	1
Sleeping Sickness	—	—	—	Corrosive Acids	—	—	—
Sloughing Phagedæna	8	2	8	Metallic Poisons	1	—	1
Small pox	1	—	1	Vegetable Alkaloids	6	—	6
Syphilis	—	—	—	Nature Unknown	—	—	—
(a) Primary	38	—	40	Other Poisons	7	—	10
(b) Secondary	115	2	124	Surgical Operations—	—	—	—
(c) Tertiary	8	—	8	Amputations, Major	9	1	9
(d) Congenital	—	—	—	Minor	30	—	30
Tetanus	2	1	2	Other Operations	—	—	—
Trypanosoma Fever	—	—	—	Eye	—	—	—
Tubercle—	1	1	1	(a) Cataract	—	—	—
(a) Phthisis Pulmonalis	—	—	—	(b) Iridectomy	—	—	—
(b) Tuberculosis of Glands	1	—	1	(c) Other Eye Operations	—	—	—
(c) Lupus	—	—	—				
(d) Tabes Mesenterica	—	—	—				

RETURN OF DISEASES AND DEATHS IN 1906 AT THE FOLLOWING INSTITUTIONS GENERAL DISTRICT, LOCK,
CRIMINAL PRISON, QUARANTINE CAMP, JELUTONG, EUROPEAN SMALL POX, BALIK PULAU, LEPER
HOSPITAL, PULAU JEREJAK, LUNUT HOSPITALS, AND FEMALE LEPER WARD, JELUTONG

Penang, Straits Settlements

GENERAL DISEASES

	Admis- sions	Deaths	Total Cases Treated
Alcoholism	—	—	—
Anæmia	196	62	212
Anthrax	—	—	—
Beri beri	244	58	289
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken pox	26	—	26
Cholera	4	3	4
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	144	24	156
Delirium Tremens	—	—	—
Dengue	1	—	1
Diabetes Mellitus	1	—	1
Diabetes Insipidus	—	—	—
Diphtheria	—	—	—
Dysentery	603	201	616
Enteric Fever	15	4	20
Erysipelas	3	2	3
Febricula	—	—	—
Filariasis	—	—	—
Gonorrhœa	92	—	94
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	—	—	—
Kala Azar	—	—	—
Leprosy	182	141	549
(a) Nodular	—	—	—
(b) Anæsthetic	—	—	—
(c) Mixed	—	—	—
Malarial Fever—	124	22	124
(a) Intermittent	36	—	36
Quotidian	—	—	—
Tertian	322	7	327
Quartan	3	—	3
Irregular	—	—	—
Type undiagnosed	—	—	—
(b) Remittent	—	—	—
(c) Pernicious	—	—	—
(d) Malarial Cachexia	121	18	121
Malta Fever	53	3	54
Measles	—	—	—
Mumps	73	—	73
New Growths—	2	—	2
Non-malignant	26	7	28
Malignant	1	—	1
Old Age	27	12	29
Other Diseases	137	10	137
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	—	—	—
Rachitis	—	—	—
Rheumatic Fever	—	—	—
Rheumatism	—	—	—
Rheumatoid Arthritis	344	7	384
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	2	1	2
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small pox	40	29	50
Syphilis	2	—	2
(a) Primary	111	—	—
(b) Secondary	324	12	351
(c) Tertiary	63	8	63
(d) Congenital	—	—	—
Tetanus	—	—	—
Trypanosoma Fever	7	5	7
Tubercle—	—	—	—
(a) Phthisis Pulmonalis	10	4	10
(b) Tuberculosis of Glands	—	—	—
(c) Lupus	—	—	—

GENERAL DISEASES—continued

	Admis- sions	Deaths	Total Cases Treated
(d) Tabes Mesenterica	—	—	—
(e) Tuberculous Disease of Bones	—	—	—
Other Tubercular Diseases	—	—	—
Vaccinia	—	—	—
Whooping Cough	—	—	—
Yaws	1	—	2
Yellow Fever	—	—	—

LOCAL DISEASES

	Admis- sions	Deaths	Total Cases Treated
Diseases of the—			
Cellular Tissue	106	4	113
Circulatory System—	—	—	—
(a) Valvular Disease of Heart	64	13	48
(b) Other Diseases	22	9	25
Digestive System—	—	—	—
(a) Diarrhœa	136	34	152
(b) Bill Diarrhœa	—	—	—
(c) Hepatitis	5	—	5
Congestion of the Liver	4	—	4
(d) Abscess of Liver	6	4	6
(e) Tropical Liver	—	—	—
(f) Jaundice, Catarrhal	61	2	8
(g) Cirrhosis of Liver	41	23	50
(h) Acute Yellow Atrophy	—	—	—
(i) Sprue	11	4	12
(j) Other Diseases	213	31	263
Ear	7	—	7
Eye	182	3	212
Generative System—	—	—	—
Male Organs	154	—	165
Female Organs	24	2	28
Lymphatic System	119	2	127
Mental Diseases	—	—	—
Nervous System	166	22	196
Nose	—	—	—
Organs of Locomotion	79	11	95
Respiratory System	483	186	497
Skin—	—	—	—
(a) Scabies	—	—	—
(b) Ringworm	—	—	—
(c) Tinea Imbricata	—	—	—
(d) Favus	—	—	—
(e) Eczema	33	—	35
(f) Other Diseases	631	21	742
Urinary System	83	29	85
Injuries, General, Local—	448	17	473
(a) Striasis (Heatstroke)	—	—	—
(b) Sunstroke (Heat Prostration)	—	—	—
(c) Other Injuries	—	—	—
Parasites—	70	2	75
Ascaris lumbricoides	6	—	6
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Aukyllo stoma duodenale	8	5	8
Dracunculus medinensis (Guinea worm)	3	—	3
Tape worm	—	—	—
Poisons—	—	—	—
Snake bites	—	—	—
Corrosive Acids	1	—	1
Metallic Poisons	4	4	5
Vegetable Alkaloids	19	3	21
Nature Unknown	—	—	—
Other Poisons	63	1	63
Surgical Operations—	—	—	—
Amputations, Major	2	2	3
" Minor	14	—	19
Other Operations	—	—	—
Eye	—	—	—
(a) Cataract	—	—	—
(b) Iridectomy	2	—	2
(c) Other Eye Operations	1	—	2

PRISON HOSPITAL

Report by Dr R. Dane, Colonial Surgeon

While the sanitary condition of the gaol is good, the food and water excellent and ample, the health of the prisoners is not satisfactory.

The chief causes of this are, the wretched state of health in which a large proportion of them arrive in gaol, and then disregard of the most noxious filth—a very large number will use then cells as latines—dysentery and diarrhoea are the chief causes of our mortality. It is from these diseases in a chronic form that a large number of the prisoners are suffering, on admission to gaol. Most of these cases have got accustomed to their disease, and make no complaint until a relapse occurs, or loss of weight is detected.

The prevalence of these diseases during the last two years has occupied much of my attention. No one definite cause can be indicated, but many conditions which were capable of improvement have been changed.

In July, I took advantage of the presence of Professor Simpson in Singapore, to ask that he might be requested to visit the gaol. This he did about five or six times, and in consequence of his recommendations certain alterations have been made.

Medical records, started on May 16, enable me to see how a prisoner is getting on. All the long sentence prisoners have for years been weighed twice a month. Now they are weighed once a month, and each one who has lost weight is sent up to me, together with his medical record.

Incessant efforts have been made to exterminate the vermin in the cells. The effective measures are: Beds are made of planks placed loosely side by side—cracked planks are burned. Beds for helpless diarrhoea cases, which are made of planks joined together, have the cracks and fissures caulked with oakum and tarred, planks washed by dipping in scalding water, filling up all cracks in walls, &c., with plaster. The vermin are now almost exterminated.

Total Civil Prison population 3,233. Average daily population, 54. Total admissions to hospital, 13. Deaths, 2—1 from dysentery and 1 from tuberculosis. The admissions were for dysentery 4, diarrhoea 2, consumption 2, pneumonia 1, and 4 minor diseases.

The ratio of admissions to Criminal Prison Hospital was high but not so high as in some recent years.

The death rate is high if 1906 is considered by itself. But if the ratio for 1906 and 1905 be considered together, and compared with 1904 and 1903 added together, the excess is not so marked. At the beginning of 1906, we had left a large number of chronic invalids. Of the 72 deaths amongst the criminals, a large number were admitted to gaol with the disease which eventually caused death.

The diseases which caused most admissions and deaths amongst the criminals were dysentery 201, with 29 deaths, diarrhoea 261, with 6 deaths, enteritis 3, with 2 deaths, anæmia 33, with 4 deaths, tubercular pulmonitis 26, with 15 deaths, cerebral hæmorrhage 4, with 3 deaths.

Dysentery—I do not consider that the sanitary conditions of the gaol are responsible for the large number of dysentery and diarrhoea cases for the following reasons—

(a) The sanitary condition of the prison, the food and water, are not inferior to the conditions of the previous years.

(b) Thirty eight of these patients are known to have had this disease on admission to gaol, and 38 is too low, because we find a condition of chronic dysentery after death in cases where the prisoner had during life denied ever having had the disease. Acute dysentery is rare in gaol.

Causation—The causes at work are probably many, amongst which may be—

(a) Increased prevalence of disease during last year amongst the poorer classes in Singapore.

(b) As consequences of continuous sedentary work and a generous diet, indigestion and diarrhoea are common. I have found it beneficial to give some of the middle grade more active work for a week or two.

(c) I have suspected that the punishment of habitual offenders by solitary confinement is more lasting than is intended, that beyond the punishment by monotony a serious blow is sometimes given to health. But I have as yet discovered but faint evidence to confirm my suspicion.

(d) *Parboiled Rice*—The great increase in dysentery, not equalled during the previous fifteen years, is synchronous with the exclusive use of parboiled rice, but I cannot discover sufficient evidence to warrant one in saying that parboiled rice is probably a predisposing cause to relapses. To test its effect on dysentery, and to better estimate the relationship of the different kinds of rice and beri beri, 144 long sentence prisoners were on November 11 put on Siam rice exclusively, while the rest of the prisoners remained on parboiled rice exclusively. Unfortunately, one of those on Siam rice for some reason developed beri beri, so I put the whole lot on parboiled rice again. Comparison with other institutions on parboiled, and others on Siam rice would be instructive.

(e) *Water*—The greatest possible care is taken to prevent the prisoners from drinking anything but boiled municipal water. This is supplied to them twice daily, but it is certain the night supply is likely to be contaminated by the prisoners themselves. (See beginning of Report.)

Dietetic—I found meat juice, or rather the following preparation of raw meat—1 lb. meat scraped fine with a knife is soaked in 4 oz. water for half an hour, the resulting liquor and the meat is then filtered by pressure through a muslin cloth—to be much more useful than treatment by milk, beef tea, egg albumen, &c. All the ordinary extras were ordered as considered necessary.

Anæmia—Twenty five criminals gave 32 admissions for this disease, which was certainly acquired by 8 of them before arrival in the gaol. One of them had fatty liver, others a history for years of chronic diarrhoea or dysentery. In some no cause could be traced.

Consumption (Tubercular Pulmonitis)—Twenty six admissions from the criminal prison for this disease are recorded, but the evidence for 5 is hardly sufficient to justify a positive diagnosis of tuberculosis, so they must be regarded as doubtful cases, 10 of the rest arrived in gaol with the disease. Others were invalids from, and before their arrival in gaol with, chronic diarrhoea, &c.

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(continued)

Cerebral Hemorrhage—Of the 4 cases, 3 died, 1 had syphilitic disease of the arteries, 2 had vessels degenerated from atheroma

Enteric Fever—Six cases occurred during the year, 3 were stone breaking, 3 middle grade, 2 died and 4 recovered. The origin could not be detected in any case.

Beri-beri—Four cases occurred during the year. The first case was on June 9, he had been in gaol four years, it was a first attack. For the five months before he was taken ill he had been on parboiled rice exclusively, he recovered. The second case occurred on January 10, he had been in gaol three years, it was the fourth attack. For the five months before he was taken ill he had been on parboiled rice exclusively, he died. The third case occurred on March 9, he came into gaol with the disease, it was a first attack, he recovered. The fourth case was on December 5, he had been in gaol one year, it was a first attack. For the first eleven months of his imprisonment he

had been on parboiled rice exclusively, but for three weeks before he was found to have beri-beri, he had had Siam rice only, he recovered.

Rice and Beri-beri—From 1887 to 1897 we had only 9 cases of beri-beri, and the Siam rice was used exclusively. From 1898 to October, 1904, we had between 124 and 415 cases a year, and Siam rice was still the only kind used. From November 1, 1904, to July 31, 1905, seven tenths of the rice was parboiled, and three-tenths Siamese, and during this period only 48 cases occurred. For the next fourteen months parboiled rice was used exclusively, and only 9 cases occurred. Since then only one case has occurred, and parboiled rice has been almost exclusively used.

SINGAPORE GAOL

The following is the death-rate amongst the criminals to the average daily population in the gaol—1895, 10.29, 1896, 6.63, 1897, 2.39, 1898, 1.62, 1899, 2.20, 1900, 4.76, 1901, 3.69, 1902, 4.27, 1903, 4.68, 1904, 5.54, 1905, 3.32, 1906, 7.84

PERCENTAGE OF ADMISSIONS TO HOSPITAL FOR THE CRIMINAL AND CIVIL PRISONERS SEPARATELY TO THE TOTAL POPULATION OF EACH

	1898	1899	1900	1901	1902	1903	1904	1905	1906
Criminal prisoners	29.8	28.0	21.5	19.8	35.9	24.9	24.6	27.2	29.0
Civil prisoners	0.6	0.8	.44	.45	1.18	1.23	.55	.90	.04

TABLE SHOWING THE NUMBER OF CASES OF BERI-BERI ACQUIRED BEFORE ADMISSION TO GAOL

	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906
(a) Number of cases of beri-beri	3	124	165	224	219	415	169	268	50*	4
(b) Beri-beri recognized within thirty days of admission to gaol	2	9	9	18	22	51	26	35	30*	1
Percentage b to a	66	7	5	8	10	12	15	13	60	Figures too small for comparison

* Includes twenty re-admissions. See note on following table.

TABLE SHOWING THE NUMBER OF CASES OF BERI-BERI OCCURRING IN THE GAOL EACH MONTH AND THE NUMBER OF THEM RECOGNIZED WITHIN THIRTY DAYS AFTER THEIR ARRIVAL IN GAOL—"ADMITTED WITH DISEASE"

	1897		1898		1899		1900		1901		1902		1903		1904		1905		1906	
	Total	Admitted with beri-beri	Total	Admitted with beri-beri	Total	Admitted with beri-beri	Total	Admitted with beri-beri	Total	Admitted with beri-beri	Total	Admitted with beri-beri	Total	Admitted with beri-beri	Total	Admitted with beri-beri	Total	Admitted with beri-beri	Total	Admitted with beri-beri
January			1		22	2	5	2	15	4	22	2	22	3	30	5	3	1	2	
February			1	1	25	4	3		10	5	8	3	6	4	13	3	21	*20		
March					25		1		4	1	2		6	2	20	7	1		1	
April			1	1	23		8		17	3	8	3	3		16	3				
May			2	1	5		14		25		18	4	1		28	3	1			
June					7	1	32		17		79	5	3	2	11	1	7			
July			1		7		36	1	23	2	86	10	1		29	5	11	8		
August			2	1	19	1	8		12	1	27	3			34	2	1			
September			6	1	3		32	2	10	1	36	4	2		45	2	3			
October			10	2	5	1	24	1	19	1	62	6	7	3	26	2	2	1		
November	2	1	78	1	8		44	4	41	4	35	10	53	7	10					
December	1	1	22	1	16		17	7	26		32	1	65	5	4				1	
Total	3	2	124	9	165	9	224	18	219	22	415	51	169	26	266	35	50	30	4	1

* Twenty prisoners with beri-beri were sent to Malacca for the benefit of their health. These twenty admissions are the same individuals returned convalescent.

TAN TOCK SENG'S HOSPITAL

Report by Dr H J Gibbs, Resident Medical Officer

On January 3, twenty-four females who had remained at the end of the year were transferred to the hospital on the Bukit Timah Road, under the care of the Colonial Surgeon, and the ward they occupied here closed. This report, therefore, has to do with males only.

Remaining Dec 31, 1905	Admitted 1906	Total treated	Discharged 1906	Died 1906	Remaining Dec 31, 1906
521	7,124	7,645	5,892	1,220	533

The daily average sick was 519.98, and the percentage of deaths to total treated was 15.96.

This death rate, although it compares favourably with those of preceding years, leaves a great deal to be desired. It is due in the main to three factors: (a) The deplorable condition of the patients on admission, (b) the want of adequate nursing, (c) the insufficiency of medical officers and trained dressers. Until these factors are eliminated I fear but little improvement can be expected.

Of the 1,220 deaths that occurred, 471, or 38.60 died within ninety-six hours of admission (226 dying within twenty-four hours, 92 from one to two days, 83 from two to three days, and 70 from three to four days). Of the total deaths the percentage of those dying within twenty-four hours was 18.52.

The chief causes of admissions with respective deaths in brackets were: venereal diseases, chiefly syphilitic, 996 (14), malaria, 1,021 (136), beriberi, 811 (139), tuberculosis, 419 (255), dysentery, 446 (223), phagedæna 77 (28), enteric fever, 49 (28), diarrhoea, 138 (65), cirrhosis of liver, 34 (24), pneumonia, 93 (50), Bright's disease, 37 (11), valvular disease of the heart, 95 (32), abscess, 31 (5), ulcers, 797 (nil), injuries, 288 (10), and malignant growths, 28 (16).

As interest of late centres around malaria and beriberi, I will confine my remarks to these diseases. What Dr Ford had to say of the others in 1905 holds good for 1906.

Malaria—A special report was submitted in which it was shown that 18 patients remained at the close of 1905, 1,021 were admitted, and 136 died, which gave a percentage of deaths to those treated of 13.09, 877 were discharged, and 26 remained in hospital at the end of 1906.

It further showed that several of the admissions were re-admissions, it being almost impossible to persuade a malarial patient to remain in hospital for more than a couple of days after his temperature had fallen to normal. That, of the types prevalent, the benign tertian predominated, and amongst the malignant cases subtertian rings and crescents were commonly found, that the majority of deaths, as was to be expected, occurred amongst the malignant cases, dysentery often proving an intractable and fatal complication, that the patients came from all parts of the Island, neighbouring territories, India, Ceylon,

Burma, and China, some of the worst cases occurring amongst the coolies on the Johore railway construction works, and, in a few fatal cases, the patients were too ill to give any address.

The table attached to the report showed that the greatest number of cases were respectively admitted in the months of October, December, July, November, and September, with a comparatively low death rate, whereas May, April, January, August, and March, provided cases of a much graver type, the mortality ranging from 15.28 per cent in March to 20 per cent in May.

As far as treatment was concerned, it was found that the milder cases yielded to calomel, saline purges and small doses of quinine, while those affected with the malignant parasite needed in addition to calomel and saline, intra muscular injection of the tartrate of quinine in 10 grain doses every four hours, or, 20 to 30 grain doses of the sulphate twice a day by the mouth.

In the matter of prophylaxis a film of every patient's blood was taken on admission, if a malaria parasite was found he was sent into a ward provided with mosquito curtains and quinine administered.

Earth drains were cut through various parts of the hospital grounds, and these have proved very effective in keeping this damp site fairly dry. The dense undergrowth at the back of the hospital was cut and burnt by the Public Works Department.

Beriberi—On this disease, also, a special report has been submitted. There it was shown that 119 cases remained at the end of 1905, 812 were admitted, and 139 died, giving a percentage of deaths to those treated of 14.93, or 17.14 on the admissions, against 32.21 in the previous year.

This favourable death rate is mainly due to the feeding of the patients for the whole of 1906 on parboiled Siam rice.

Of the 139 deaths, 87 occurred within nine days of admission, 43 dying within twenty-four hours, 10 from twenty-four to forty-eight hours, 5 from two to three days, 9 from three to four days, 6 from four to five days, 3 from five to six days, 4 from six to seven days, 4 from seven to eight days, and 3 from eight to nine days.

On the total cases treated, these 87 deaths work out to 9.34 per cent. The death rate from this disease has fallen from 46.31 in 1904, when only uncured Siam rice was used, to 32.21 in 1905, when the patients had uncured rice from January 1 to May 23, and parboiled from May 23 to December 31. That favourable death rate is nearly double that for 1906 (17.14 per cent).

No cases of beriberi, as far as could be ascertained, occurred amongst the inmates admitted for diseases other than beriberi, it being noteworthy that whereas in former years, prior to the introduction of parboiled rice, there were many fatal cases amongst the blind, this year there were none. On the other hand the female lepers who were fed on the uncured rice throughout 1906 remained immune.

Twenty-eight malignant new growths were admitted, these, with the two remaining at the end of 1905, made a total of 30 treated. They comprised carcinomata of liver, pharynx, œsophagus, stomach and cervical glands, lymphosarcomata of the cervical

RETURN OF DISEASES AND DEATHS IN 1906 AT THE FOLLOWING INSTITUTIONS —GENERAL PAUPER,
CONTAGIOUS DISEASE, GAOL, ALOR GAJAH, AND JASIN HOSPITALS,
Malacca, Straits Settlements

GENERAL DISEASES				GENERAL DISEASES—continued			
	Admis- sions	Deaths	Total Cases Treated		Admis- sions	Deaths	Total Cases Treated
Alcoholism	1	—	1	(d) Tabes Mesenterica	—	—	—
Anæmia	7	—	8	(e) Tuberculous Disease of Bones	—	—	—
Anthrax	—	—	—	Other Tubercular Diseases	—	—	—
Beri-beri	471	45	547	Varicella	—	—	—
Bilharziosis	—	—	—	Whooping Cough	—	—	—
Blackwater Fever	—	—	—	Yaws	—	—	—
Chicken pox	1	—	1	Yellow Fever	—	—	—
Cholera	—	—	—				
Choleraic Diarrhœa	—	—	—	LOCAL DISEASES			
Congenital Malformation	—	—	—	Diseases of the—			
Debility	37	18	37	Cellular Tissue	24	1	29
Delirium Tremens	—	—	—	Circulatory System—	—	—	—
Dengue	—	—	—	(a) Valvular Disease of Heart	7	1	7
Diabetes Mellitus	—	—	—	(b) Other Diseases	—	—	—
Diabetes Insipidus	—	—	—	Digestive System—	—	—	—
Diphtheria	—	—	—	(a) Diarrhœa	100	45	100
Dysentery	76	22	82	(b) Bill Diarrhœa	—	—	—
Enteric Fever	—	—	—	(c) Hepatitis	1	—	1
Erysipelas	—	—	—	Congestion of the Liver	—	—	—
Febricula	—	—	—	(d) Abscess of Liver	—	—	—
Filariasis	—	—	—	(e) Tropical Liver	—	—	—
Gonorrhœa	34	—	38	(f) Jaundice, Catarrhal	4	—	4
Gout	—	—	—	(g) Cirrhosis of Liver	7	8	8
Hydrophobia	—	—	—	(h) Acute Yellow Atrophy	—	—	—
Influenza	—	—	—	(i) Sprue	—	—	—
Kala Azar	—	—	—	(j) Other Diseases	62	2	67
Leprosy	6	—	6	Ear	1	—	1
(a) Nodular	—	—	—	Eye	31	1	37
(b) Anæsthetic	—	—	—	Generative System—	—	—	—
(c) Mixed	—	—	—	Male Organs	27	—	33
Malarial Fever—	476	9	486	Female Organs	17	—	18
(a) Intermittent	—	—	—	Lymphatic System	62	—	68
Quotidian	—	—	—	Mental Diseases	—	—	—
Tertian	—	—	—	Nervous System	21	1	24
Quartan	—	—	—	Nose	—	—	—
Irregular	—	—	—	Organs of Locomotion	22	—	30
Type undiagnosed	—	—	—	Respiratory System	133	50	138
(b) Remittent	—	—	—	Skin—	—	—	—
(c) Pernicious	—	—	—	(a) Scabies	—	—	—
(d) Malarial Cachexia	—	—	—	(b) Ringworm	7	—	7
Malta Fever	—	—	—	(c) Tinea Imbricata	—	—	—
Measles	1	—	1	(d) Favus	—	—	—
Mumps	—	—	—	(e) Eczema	23	—	26
New Growths—	—	—	—	(f) Other Diseases	628	—	693
Non-malignant	—	—	—	Urinary System	56	19	63
Malignant	—	—	—	Injuries, General, Local—	115	6	120
Old Age	2	2	2	(a) Striasis (Heatstroke)	—	—	—
Other Diseases	5	1	6	(b) Sunstroke (Heat Prostration)	—	—	—
Pellagra	—	—	—	(c) Other Injuries	—	—	—
Plague	—	—	—	Parasites—	4	—	4
Pyæmia	—	—	—	Ascaris lumbricoides	—	—	—
Rachitis	—	—	—	Oxyuris vermicularis	—	—	—
Rheumatic Fever	—	—	—	Dochmius duodenalis, or Ankylo-	—	—	—
Rheumatism	—	—	—	stoma duodenale	1	—	1
Rheumatoid Arthritis	77	—	84	Dracunculus medinensis (Guinea	—	—	—
Scarlet Fever	—	—	—	worm)	—	—	—
Scurvy	10	—	10	Tape worm	—	—	—
Septicæmia	—	—	—	Poisons—	—	—	—
Sleeping Sickness	—	—	—	Snake bites	—	—	—
Sloughing Phagedæna	—	—	—	Corrosive Acids	—	—	—
Small pox	27	5	31	Metallic Poisons	—	—	—
Syphilis	—	—	—	Vegetable Alkaloids	—	—	—
(a) Primary	11	—	11	Nature Unknown	—	—	—
(b) Secondary	183	—	203	Other Poisons	—	—	—
(c) Tertiary	—	—	—	Surgical Operations—	—	—	—
(d) Congenital	—	—	—	Amputations, Major	1	—	1
Tetanus	—	—	—	Minor	2	—	2
Trypanosoma Fever	—	—	—	Other Operations	—	—	—
Tubercle—	1	—	1	Eye	—	—	—
(a) Phthisis Pulmonalis	—	—	—	(a) Cataract	—	—	—
(b) Tuberculosis of Glands	—	—	—	(b) Iridectomy	—	—	—
(c) Lupus	—	—	—	(c) Other Eye Operations	—	—	—

glands, sarcomata of the lungs and pleura. Of these 30, 16 died and 14 left were discharged unrelieved.

Europeans — Under this heading are included Europeans, Eurasians, and Japanese, the last mentioned having been dieted and treated as Europeans. Fifteen males and 2 females remained on December 31st, 1905. One hundred and seventy-five males were admitted, making a total treated of 192 males and females. The 2 females were, as already stated, transferred. Of the 190 males 10 died, 162 were discharged, 1 absconded, and 17 remain.

The death-rate was 5.26 per cent. The diseases which caused the greatest number of admissions were Malaria 21, dysentery 14, bronchitis and alcoholism 11 each, injuries 9, pulmonary tuberculosis 8, rheumatism, primary and secondary syphilis 7 each, diarrhoea and Bright's disease 6 each, beri-beri and alcoholic neuritis 5 each.

Throughout the year the medico-legal work in connection with B and C Police Divisions was sent to us, and 420 such cases were examined, they consisted mainly of assault and varied from the merest scratch to fractures of the skull and other bones of the body, penetrating wounds of the chest and abdomen, and the commission of rape and unnatural offences.

The Coroner sent us 121 bodies for certification as to cause of death, and 26 other bodies which were the subjects of his inquests, making a total of 147 corpses on which autopsies were held either by me or the Assistant Surgeons.

Surgical Operations — As in 1905, so also in this year, many interesting operations were performed. In addition to many scores of minor operations such as suturing of superficial wounds, opening of superficial abscesses and buboes, extraction of teeth, epilation of eyelashes, skin grafting, ulcer scraping, &c, which were performed in the wards without the use of anaesthetics, the following were carried out either under the influence of chloroform or cocaine on the operating table. Those of urgency: Relief of strangulated hernia 1, laparotomy for acute intestinal obstruction 2, appendicitis 4, incision and drainage of empyemata 5, ligatures of arteries 5 (femoral 1, anterior tibial 1, posterior tibial 2, and ulnar 1), cut throat 1, urethrotomy 1, trephining for depressed fractures of the vault of the skull 3.

The others were: excision of eyeball 2, cataract 5, von Graefe operation for entropion 2, iridectomy 3, amputation of fingers 6, of leg 10 (Farabaenf 9, Teale 1), of foot (including Syme's) 5, of thigh 2, of phalanges and metatarsal bones 10, through knee joint (Stephen Smith's) 2, removal of malignant cervical glands 1, of non-malignant growths 1, suprapubic cystotomy for the removal of a large vesical calculus which occluded the urethra 1, removal of a supernumerary thumb 1, wiring of the fractured fragments of the lower jaw 1, excision of elbow 1, Thiersch's skin grafting 1, and others such as the laying open and scraping of sinuses, the opening of deep-seated abscesses in the pectorum, abdominal walls, scrotum, and extremities, the scraping and cauterization of cases of cancer oris, suturing of extensive wounds, fistula in ano, &c. In all there were 99 operations exclusive of those done in the wards without the administration of an anaesthetic.

Owing to the prevalence of cholera, small pox, &c

in the Settlement, the Quarantine Camp was occupied, with the exception of a few days throughout the year, by cases of small pox, cholera, plague, varicella, diphtheria, and cases under observation for cholera.

In addition to the cases treated in the camp, the Municipal Health Officer sent 67 bodies for the verification of diagnosis of cholera and plague. The autopsies were performed by the pathologist.

The Coroner sent 10 bodies, the General Hospital 1, the Lunatic Asylum 4, and the Police 2.

The following returns give the statistics of the Quarantine Camp —

Small pox — Admitted 27 males, 4 females, discharged, 19 males, 3 females, died, 7 males, 1 female, 1 male absconded. Of these, 13 were Chinese, 12 Indians, 2 Javanese, 2 Bengalis, 1 Japanese, and 1 Malay.

Plague — Two cases (Chinese) were admitted, 1 male and 1 female, both proved fatal.

Diphtheria — One female (Chinese) was admitted and the case ended fatally.

Cholera — Admitted, 100 males, 6 females, discharged, 14 males, died, 86 males, 6 females. Of these 96 were Chinese, 5 Indians, 2 Javanese, 1 Bugis, 1 Malay, and 1 Arab.

Leprosy Asylum — Remained, 9 males, 25 females, admitted, 73 males, 9 females, total, 116. Discharged, 3, transferred, 37, absconded, 17, all of these being males, died, 9 males, 6 females, remaining, 16 males, 28 females.

Of the totals 96 were Chinese, 8 Malays, 5 Tamils, 5 Eurasians, 1 European, 1 Japanese.

The majority of the absconders were re-arrested. In the performance of this unpleasant duty a detective was badly bitten on the hand by one of the lepers who resisted re-arrest.

At the request of eight of the female lepers, and with the consent of the Acting Principal Civil Medical Officer, Dr. Diesl, of the German Colonial Army, who professed to cure leprosy, was, at the end of 1906, allowed to experiment on them with hypodermic injections of a 30 per cent emulsion of iodoform in olive oil.

Owing to the depressing action of the drug it had to be discontinued after nineteen days treatment, but on seven of the above eight, who wished to continue the treatment, petitioning the Principal Civil Medical Officer (their signatures being attested to by the Assistant Colonial Chaplain), the treatment has been renewed. So far the results have been nil.

PAUPER FEMALE HOSPITAL AT KANDANG KERBAU

Report by Dr. R. Dane, Colonial Surgeon

These patients were transferred to this hospital on January 31st, 1906, from the Tan Tock Seng's Hospital.

They are placed in two brick wards, the foundations of which are raised on solid brick some four feet from the ground, the floors are cemented, the verandah wide and shaded, while the necessary bathrooms are in separate outbuildings. Kandang Kerbau Hospital stands in its own grounds and has the racecourse on one side. So these people are exceptionally well housed.

Total number treated, 201.

